

# Dental Digest

Sixty-Seventh Year of Publication  
Volume 67 No. 9

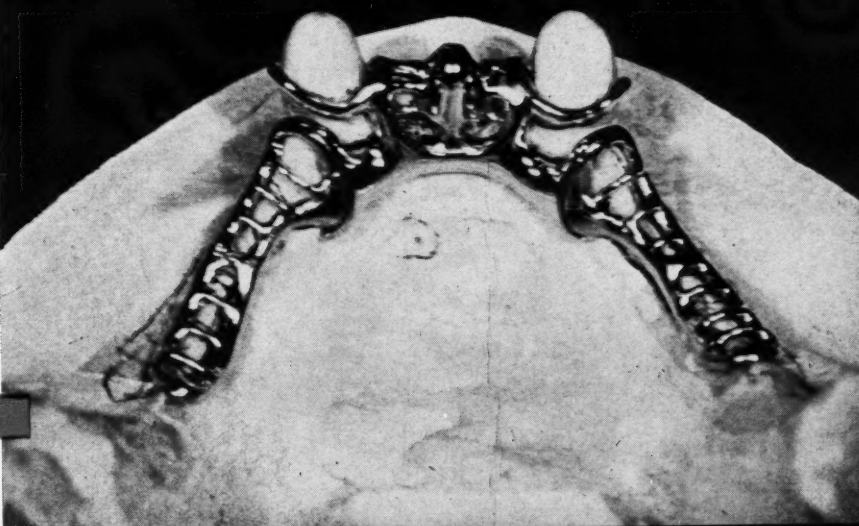
**September 1961**

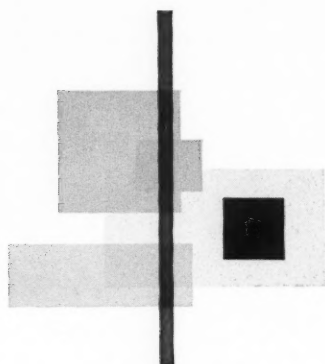
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# Dental Digest

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The magazine is mailed on the fifteenth of the month of issue.

# Time and Motion ECONOMY in

## DENTAL PRACTICE ADMINISTRATION

EDGAR M. MILLER, D.M.D., Lowville, New York

### DIGEST

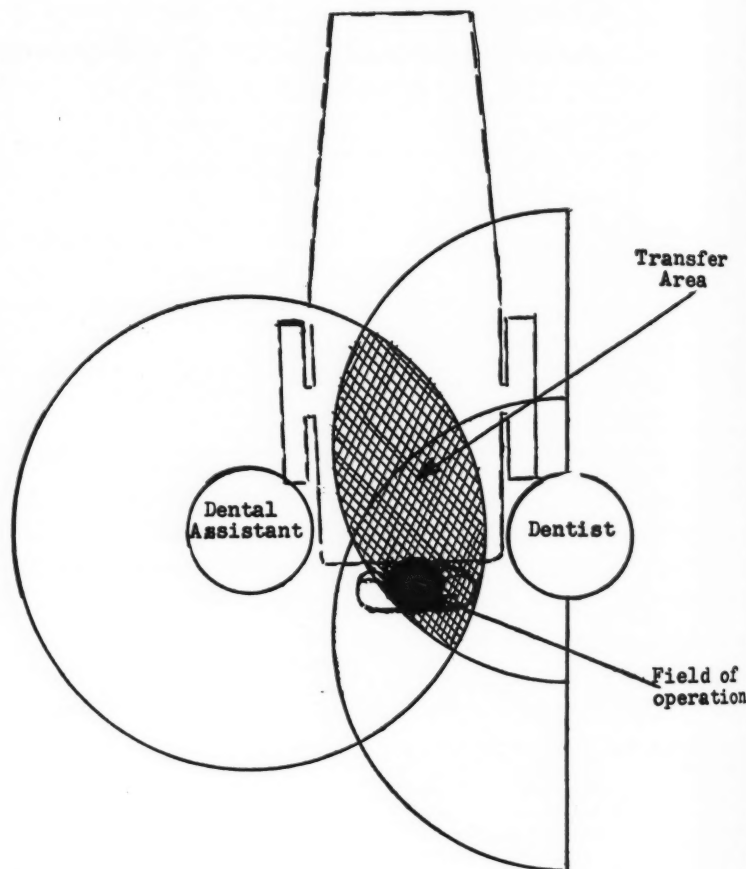
*Modern dentistry requires the utilization of all the improved equipment available and also the services of a staff of professional assistants. In addition to these basic requirements for the production of superior dentistry in a definite number of work hours, the work area should be specifically designed for this purpose. This article presents information concerning the necessary armamentarium and the techniques involved in time and motion economy in a modern dental practice.*

### Basic Premise

Dental practice administration has been defined as "the orderly arrangement and administration of all the useful facilities and services needed for a productive, professional life."<sup>1</sup> This includes the utilization of personnel and equipment in such a manner that the dentist performs only those duties which he alone is licensed to do. This is the basic premise of motion and time economy. It is assumed that for efficiency the personnel will include at least one full time chair assistant. Secretarial duties, scheduling of patients, telephone services, billing and financial transactions necessary in the modern dental office require the services of a full time receptionist. This permits the dentist to concentrate on the production of superior dentistry while his chair-side assistant or assistants can devote their entire attention to the dental operatory procedures and the comfort of the patient. With a staff of three or four properly

<sup>1</sup>Hillenbrand, Harold: Practice Management and Principles of Ethics, Northwest D. 31:59 (April) 1952.

<sup>2</sup>Miller, Edgar M.: Registered Clinic, Time and Motion, Greater New York Dental Meeting (Dec.) 1960.



1.  
Dental work area.

trained assistants a day of seven working hours should result in six hours of productive dentistry. The efficient dentist should be able to complete enough dentistry so that his average hourly week need be no longer than 30 chair-side hours.

### Work Space Lay-out

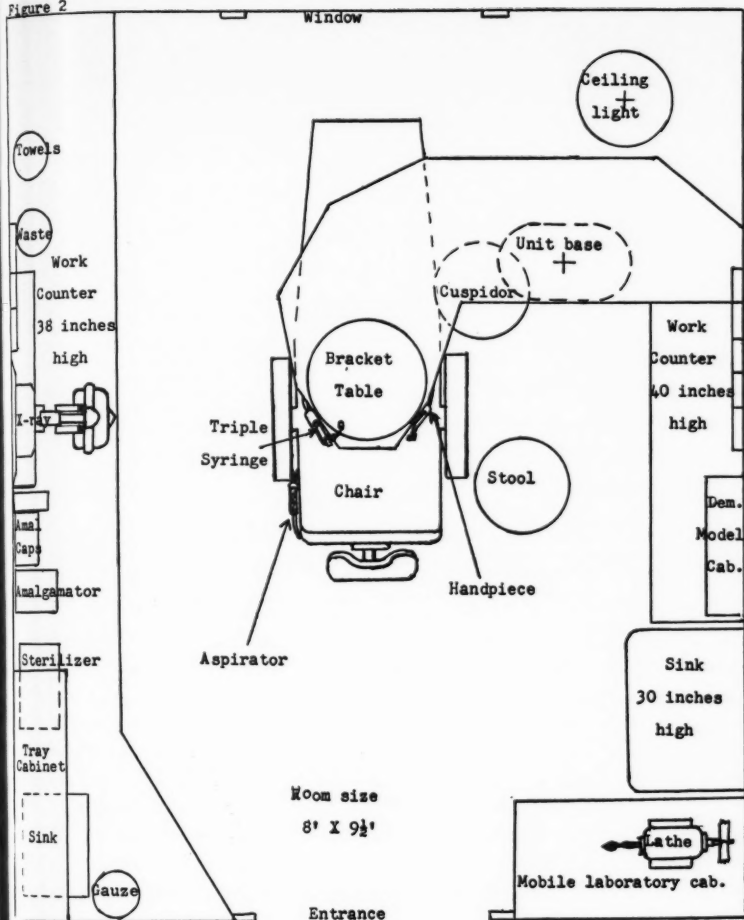
Work simplification has been sponsored by many large industries. Figure 1 shows the basic lay-out designed by an engineer from General Electric

Company, Alex Stefanik, and adapted for dental operatory procedures by Edgar M. Miller, D.M.D., and John S. Miller, D.M.D. The underlying concept in this type of work lay-out is that the area of operation, the patient's mouth, is the focal point for both the dentist and the dental assistant and that all dental operations pertain to this point.

*Characteristic Movements* — The dentist in his seated position on the patient's right is permitted Class I and



Figure 2



2.

## Dental operatory design.

II movements as outlined by the semi-circular arcs for the right and left hand. The dental assistant seated on the left of the patient is permitted Class I, II, and III movements designated by the circular arc.

**Surplus Movements Eliminated**—The transfer area, that is, that area in which the dentist may put down an instrument, his assistant may pick up an instrument, or hand him an instrument is the shaded area directly in front of the patient's mouth. Since patients receive all forms of dental treatment in a fully reclining position they are unable to view the instrumentarium in the transfer area. All dental instruments and dental materials enter the patient's mouth from the front; therefore, cross handed motions, double manipulation, and body twisting are eliminated.

### Operatory Design and Accessories

From the basic work lay-out the operatory design was developed as shown in Figure 2. The mobile work counter and bracket table, modular in shape and design, surmounting the unit base is pivoted at a point near the right wall of the operatory to allow the patient to be seated in the chair.

**Dentist is Seated**—Patients are admitted and dismissed from the left side of the chair only, thereby enabling the dentist to remain seated comfortably on the stool.

**Bracket Table in Position**—When the patient has been seated in the chair and the chair fully reclined, the bracket table is brought into the operating position shown in Figure 2 and the dental procedure is begun.

**Highspeed Handpiece Used**—The

handpiece located on the right side of the bracket table is the only instrument on the dentist's side of the transfer area. This handpiece is an air-driven high speed handpiece used exclusively in wash field dentistry and is the only handpiece used for all operatory and surgical procedures in the mouth. Mounted as shown in Figure 3 the handpiece is convenient and within easy reach of the dentist's right hand.

**The Triple Syringe**—On the other side of the bracket table is mounted the triple syringe, an important and necessary piece of equipment in the modern dental operatory. This is at the immediate left of the dental assistant as she is seated or standing in her chair-side position during an operative procedure.

**Aspirator Hose**—On her right attached to the back of the chair is the aspirator tip in place. The competent use of such equipment requires a high degree of ambidexterity in the dental assistant.

**Radiographic View Box**—Immediately in front of the patient and on the right of the dentist is the radiographic view box. This important adjunct to operative dentistry is in a position where the operator may, without removing his hands or instruments from the patient's mouth, perceive at a side-ward glance the extent of carious destruction of the teeth involved in the next operatory procedure. In fact, when his assistant has positive retraction and quadrant and half mouth dentistry is being undertaken, the dentist may at times quickly glance at the radiographs and return to the mouth without removing his foot from the floor switch that operates the air-driven handpiece. This procedure, once thought dangerous, is now acceptable and is perfectly safe because of the presence and aid of a capable dental chair-side assistant.

### Transfer Area and Field of Operation

On the bracket table is a dental operative tray (Fig. 4). This contains all instruments, wedges, cotton pellets, cotton rolls, and dental floss necessary for the placement of amalgam or sili-



**3.**  
*Operating position, posterior view.*



**4.**  
*Operating position, anterior view.*

cate restorations. In the bur block on the left are located the three or four necessary rotary instruments. These trays and bur blocks are duplicated identically with ten in each operatory. This makes it possible to sterilize only once a day; the tray set-ups are made ready for the complete day's operative procedures. Special trays are also used for crown and bridge, root canal, oral prophylaxis, surgical, and periodontal procedures.

### **Procedure Illustrated**

The operative procedures shown in Figure 4 illustrate the preparation of the lower right quadrant for the place-

ment of amalgam restorations. The dentist is shown with the air-driven handpiece in his hand while the assistant is retracting the tongue with the aspirator and has ready the triple syringe to dry the cavities immediately upon completion for closer inspection. This whole procedure may be done without the dentist removing either hand from the mouth.

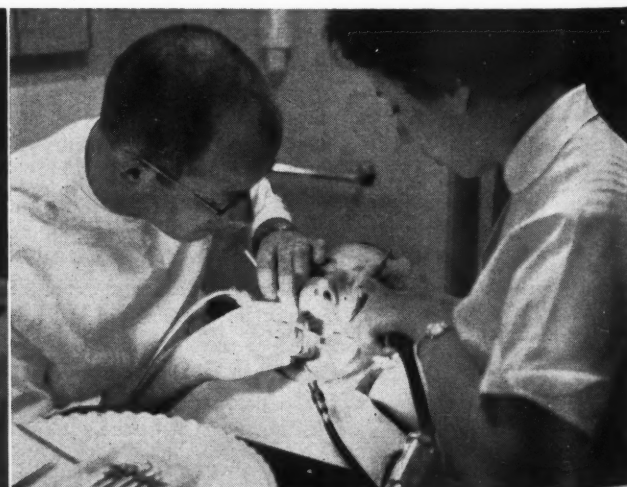
*Procedure in Upper Right Quadrant*—Figure 5 illustrates the same procedure in the upper right quadrant. Note that all quadrants are treated under direct vision, the mirror in the dentist's left hand being used only for tissue retraction and for inspec-

tion. The dental assistant is using the same operative instruments as those shown in Figure 4; the aspirator in her right hand and the triple syringe in her left hand. This quadrant also may be completed without interruption by intermittently drying the preparations for closer inspection. The dentist is seated comfortably looking directly into the field of operation and need make no unnecessary movements.

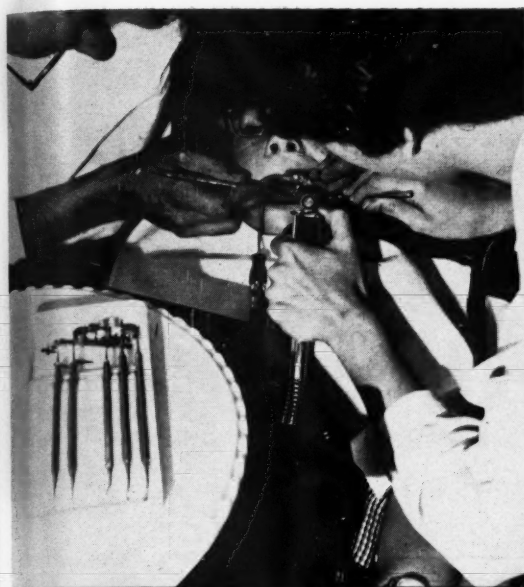
*Lower Left Quadrant Prepared*—In Figure 6 is shown the preparation of the lower left quadrant; the dentist is retracting the tongue with a mirror held in his left hand while the dental



**5.**  
*Operating position, anterior view.*



**6.**  
*Operating position, anterior view.*



7.  
*Operating position, anterior view.*

8.  
*Dental operator.*

assistant is retracting the cheek with a mirror held in her right hand meanwhile using the aspirator in her left hand to remove water accumulating in the floor of the mouth and on the back of the tongue.

**Method to Dry Cavity**—The secondary saliva ejector type of aspiration shown also serves not only to remove water from the floor of the mouth but to inhibit the patient's desire to expectorate. The triple syringe is then placed in its socket a few inches away from the dental assistant's hand and may be picked up at any moment to dry out a cavity for further inspection.

**Minimum Motion Required for Restorations**—When the cavity preparation has been completed the simple placement of restoration materials may be undertaken with a minimum of motion. The amalgamator and the amalgam capsules, preloaded and color coded for 1, 2, or 3 portions of amalgam are located directly behind the dental assistant. She has only to turn on her stool to select the proper

capsule, place it in the amalgamator, and return to the bracket table to produce the material for an amalgam restoration (Fig. 7).

**Area Reserved for Assistant**—In Figure 8 a broader aspect of the operator is shown and the relationship and proximity of the work areas involving the dental assistant.

### **Equipment**

For those who are experienced in time and motion economy and dental practice administration this article may offer nothing new. For those who are interested but have not been able to adapt these methods to their own operatories the following equipment will be found useful:

1. **Stool**—If one has been tried and found to be unsatisfactory, select a different type and try again. It is no longer possible for a dentist to say dental operations cannot be done in a seated position.

2. **Relocate Cabinet and Unit**—In many instances this will mean dispens-

ing with the unit completely, or replacing it with a cuspidor pedestal. The cabinet should be on the patient's left.

3. **Air-driven Handpiece**—Try several types, and diligently attempt to eliminate each week one more procedure formerly thought possible to be done only with a slower, belt-driven handpiece.

4. **Central Vacuum**—Most necessary in washed field dentistry.

5. **Triple Syringe**—Eliminates several instrument changes for the dental assistant and allows uninterrupted cavity preparation, restoration, and finishing.

6. **Motorized Chair Back**—This allows positive control of head position with little or no interruption to operative procedures.

This equipment is listed in order of its importance. Attempts should be made gradually to acquire proficiency in the use of each of these instruments.

37 Shady Avenue



# Center-Poise Balanced Partial Denture Construction

## FOR REHABILITATION OF MOBILE TEETH

ARTHUR C. JERMYN, D.D.S.\*, Rochester, New York

### DIGEST

*This article presents a new procedure for complete rehabilitation of the mouth in which only a few teeth are present. The basic principle of the procedure is that of even distribution of stress and includes the use of a specially designed connecting splint bar made with a small hemispheric knob midway between the abutment teeth. Step-by-step directions are presented for each phase in the construction of the center-poise partial denture.*

### Problem in Rehabilitation

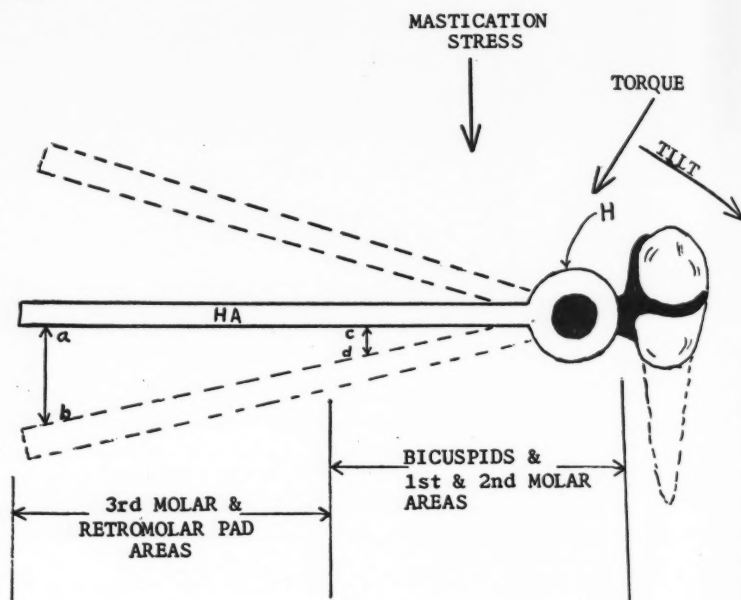
One of the difficult problems confronting the dentist is the situation in which only a few teeth remain in the upper or lower arch. These remaining teeth are often highly mobile, and either tilted labially or in the process of shifting because of labial cortical bone destruction and resorption. Stresses of mastication and malocclusion, resorption of the posterior ridge, and loss of vertical dimension encourage destruction. Periodontal disease is often present causing further loss of supporting bone so that indications for reconstruction are poor.

*Conventional Methods Unsatisfactory*—In previous attempts at reconstruction and rehabilitation the author has used the usual conventional methods of splinting these teeth together,

\*Editor, *Journal of Implant Dentistry*.

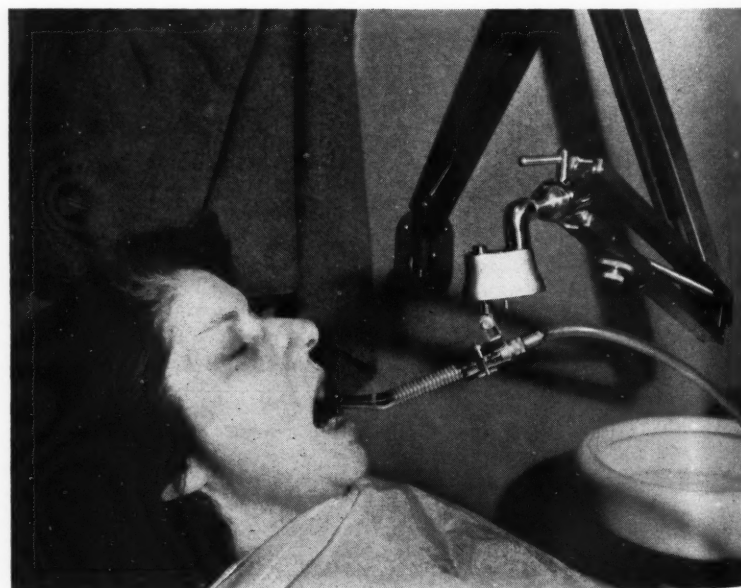
### 2.

*Use of Parallaid machine ensures that all cutting of teeth preparations are parallel with the correct degree of taper or draw. The machine holds the hand-piece at the desired angle for path of insertion.*

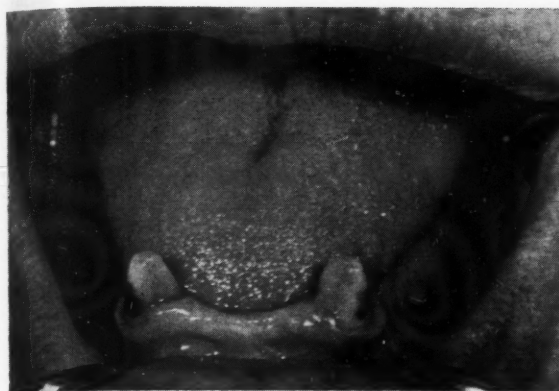


### 1.

*Diagrammatic sketch of hinge type stress-breaker partial. Hinge (H) with hinge arm (HA) is designed to reduce torque, but hinge arm (HA) has much greater arc over area 'a' to 'b,' which is the retromolar pad area where least resorption takes place. As resorption takes place and clasps loosen, torque tends to loosen the abutment tooth and permits anterior movement of the tooth. Compare 'a to b' to short range of 'c to d.'*



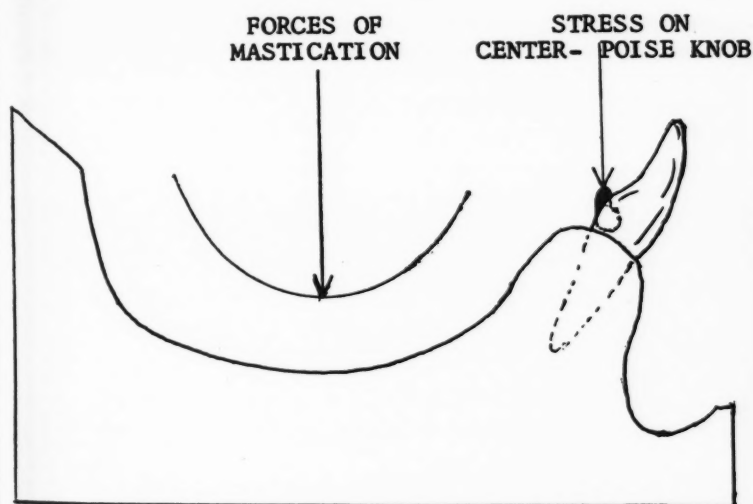




3.  
Picture of two mobile cuspids prepared for crowning.



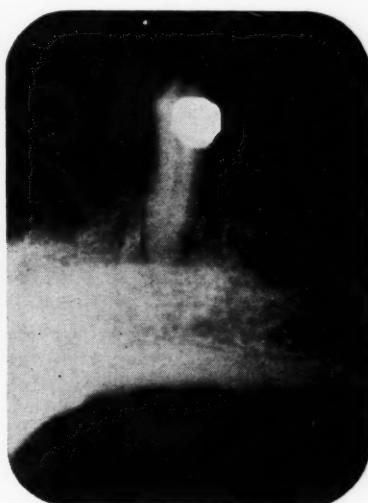
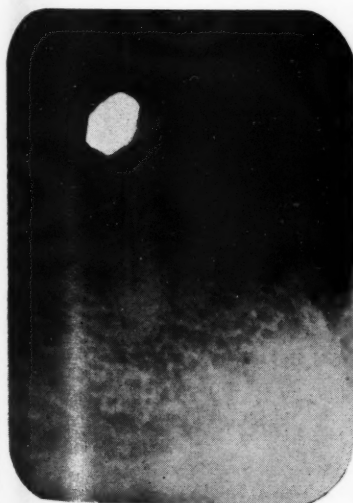
4.  
Gold copings with splint bar in place. Note center-poise knob.

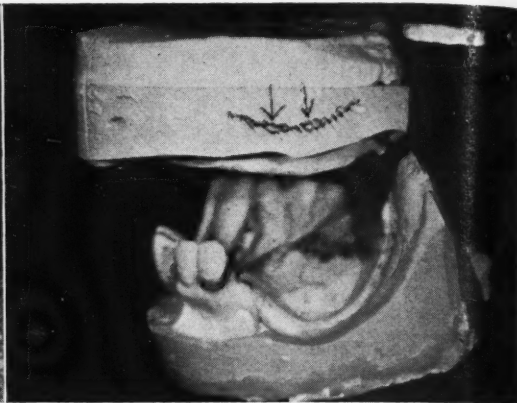
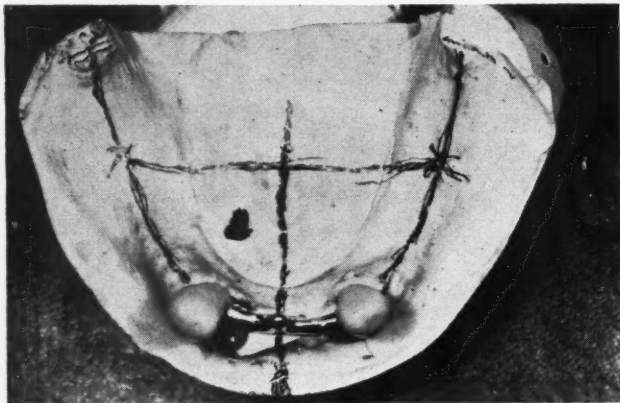


5.  
Diagrammatic sketch of lateral view of the case in Figure 1 showing how center-poise knob is placed parallel with forces which are at right angles to Curve of Spee. This prevents further labial tilting of teeth.



6.  
Roentgenograms of abutment teeth, showing strong trabecular pattern around teeth.





**7A and 7B.**

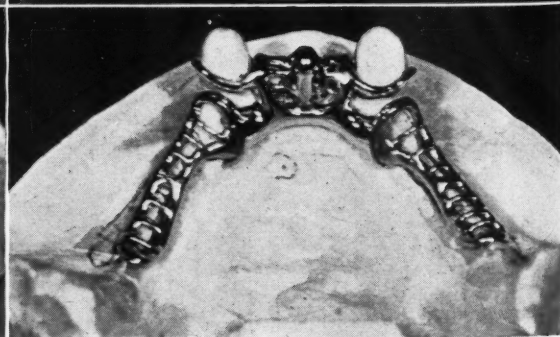
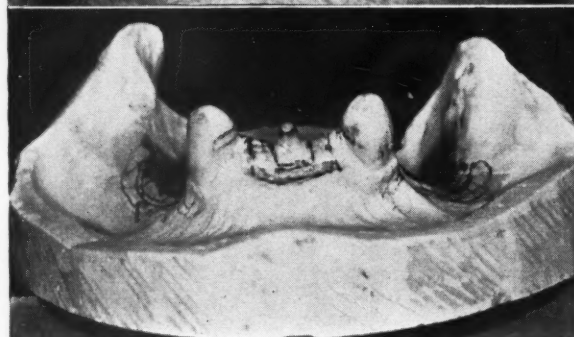
*Models showing determinations of correct placement of bar and center-poise knob.*

and replacing the edentulous areas with conventional partial prostheses, with and without the free-end stress breaker attachments. All these attempts at reconstruction seem to fail

after a time and eventually loss of the teeth occurs. The reasons for failure are implicit in the physics involved in reconstructing by older methods.

*Splinting a Temporary Measure—*

Since torque is present with the usual types of partial prostheses splinting the teeth will not be permanently successful. The free-end stress breaker partial denture has been useful, but



**8.**

*View of bridge in position. Splint bar is relieved above mucosa approximately .015 inch to prevent impingement from settling, which always takes place as teeth are driven into their sockets during tightening period.*

**9.**

*View of partial denture casting. Casting is relieved over bar and around teeth and only rests on center-poise knob.*

**10.**

*The line drawn around center-poise knob tip shows the only area of pressure.*

**11.**

*Lingual view of partial denture casting. Clasps are relieved all around teeth except at tips of clasps.*



## 12.

*Side view of the case in the mouth showing where gold foil was placed later because of wear of tips of clasps. Later cases were made with gold exposed in these areas to prevent wear.*

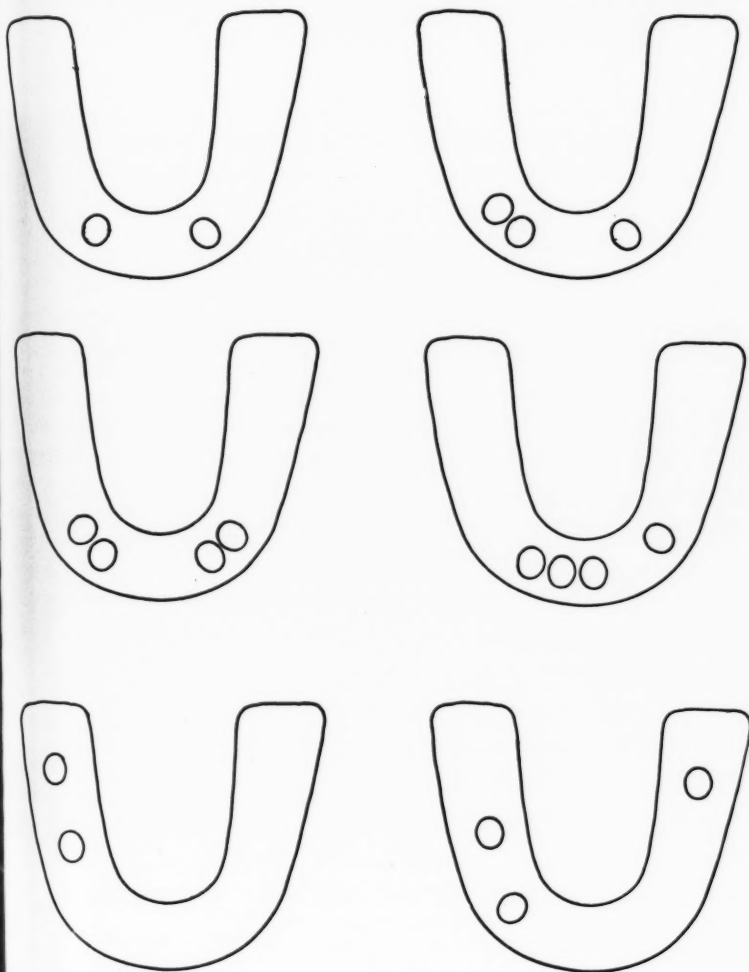
the principles involved and the actual conditions existing in practical application are not in harmony.

Figure 1 shows that the hinge type stress breaker partial does not do what is intended by the hinge. The area of least compression and change due to bone resorption is over the retromolar pad area where the greatest arc of the hinge proves to be unnecessary. The greatest resorption of the bony ridge takes place in the area of the bicusps and first molar where the hinge movement is retarded. Because of this construction, torque is still placed on the supporting abutment teeth. And since the majority of people are one-sided chewers this torque is usually greater on one side, allowing an uneven distribution of pressures. This results in further breakdown of the remaining alveolar bone and the necessity for eventual extraction of these teeth.

## Distribution of Pressure

The method presented here is based upon even distribution of stresses on the remaining teeth regardless of whether the patient is a one-sided chewer. The method also distributes the stresses evenly upon all the remaining teeth whether they be two or more. Resorption of the posterior alveolar ridges is more even, making the necessity for rebasing less frequent.

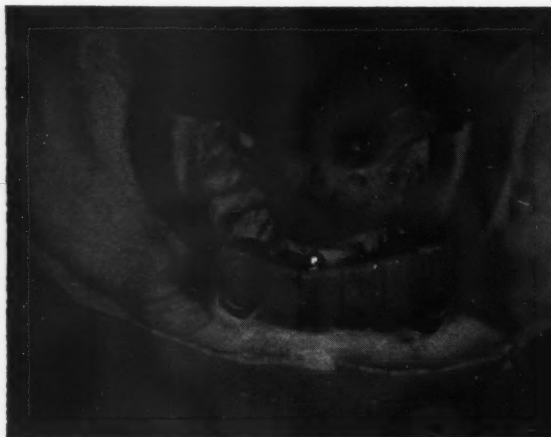
*Similar Approach*—Others have realized the shortcomings of present methods and have attempted solutions. E. Dolder<sup>1</sup> of Zurich attempts to gain a more equal distribution of forces by splinting together the roots of the remaining teeth and fastening precision partials to a bar connecting them. His principle differs from the author's by using the whole splinting bar as retention. This principle still allows uneven distribution of pres-



## 13.

*Six variations of placement of abutment teeth where center-poise cases have been placed. Many other variations have also been done.*

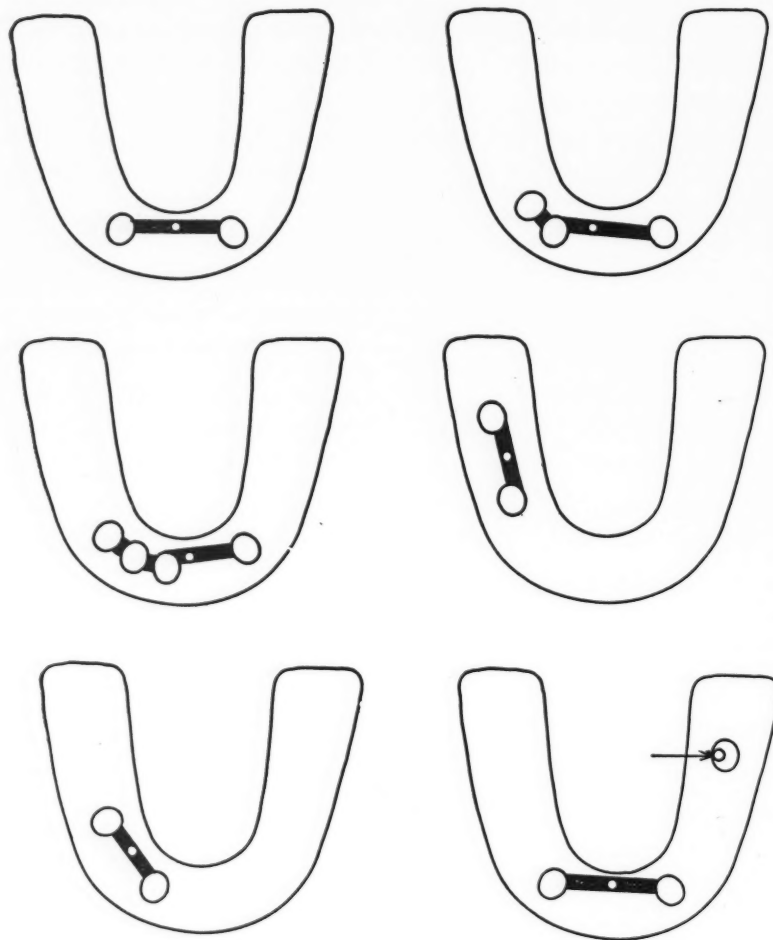
<sup>1</sup>Dolder, von E.: Die Steg-Gelenk-Prothese im Unterkiefer. Deutsche Zahnärztliche Zeitschrift, Heft 1:20-27 (January) 1959, and Heft 2:80-89 (January) 1959.



**14A and 14B.**

View of another center-poise balance technique in use. The bridge is completed with the center-poise knob cast on the

lingual side of the bridge. The lingual bar partial with concavity rest extension fits over knob.



**15.**

Correct positions of splint bars and center-poise knobs are shown in some of the variations of the technique. Lower right: auxiliary rest is shown placed on remaining molar. See arrow.

asures of one-sided chewing and also means destruction and removal of the crowns of the teeth; endodontia, which is also required is unnecessary and possibly deleterious.

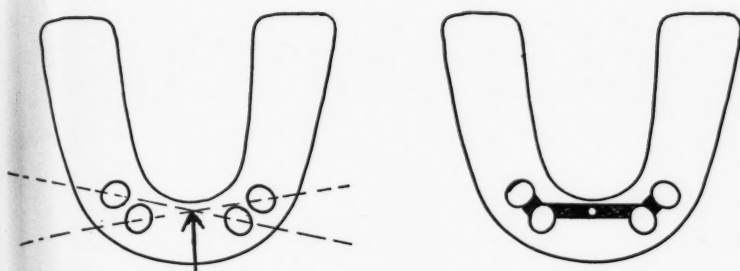
**Difficult and Complicated Procedures Avoided**—In each of the illustrated cases the patient was referred for extraction of the two or more loose periodontally involved teeth. In these cases it was anticipated by the referring dentist that upon extraction of the teeth, extremely difficult full denture prosthesis and possibly implant prostheses might be necessary. But in over four years of reconstructing by this method, success has been total and an almost immediate tightening of these highly mobile teeth has been noted. In many of the cases the teeth were so loose that great care had to be exercised in preparing them for the crowns to prevent accidental extraction.

### Procedure

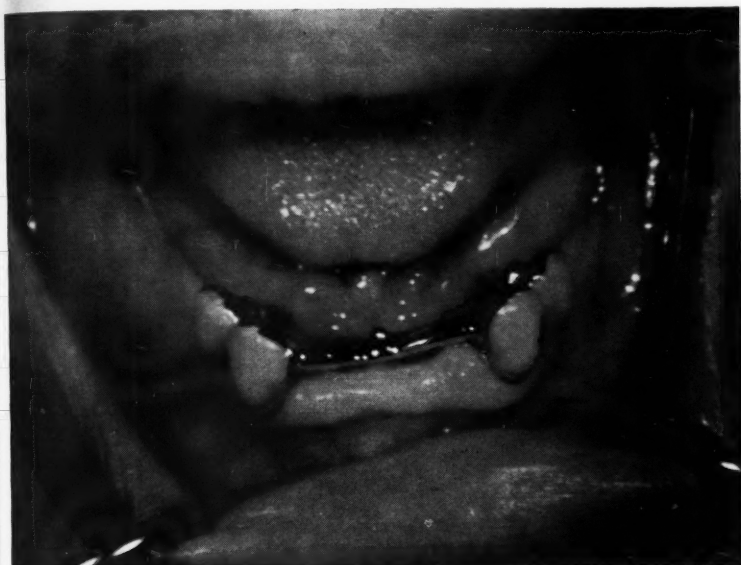
Complete diagnosis was obtained by means of study models and roentgenograms. All periodontal correction was made before bridge construction was started.

**Preparatory Measures**—Regardless of the number of teeth involved, full gold veneer coverage is used for anterior teeth; and dependent upon the caries index, full coverage or MOD onlays are used for posterior teeth





**16A.**  
Left: imaginary lines are drawn criss-cross through abutment teeth to determine the correct position of center-poise knob and splint bar.



**16B.**  
Actual case constructed according to principles outlined in Figure 16A.

restorations. The teeth are functionally surveyed in the mouth to determine the exact place of greatest bulk removal. In preparing the teeth an instrument called a Parallaid is used which enables perfect parallel cutting of the teeth with proper taper and draw. The use of this instrument also conserves tooth bulk as much as possible while ensuring parallel cutting (Fig. 2).

**Principles Involved**—Like a three-legged table where pressures placed anywhere within the leg supports of the table top exert equal pressure on all three legs in this method, pressures are absorbed by the posterior ridges and retromolar pads and the remaining teeth equally. It can also be compared to the trailer hitch on an automobile, in which the load is supported

by the two wheels of the trailer and the single forward ball joint on the back bumper of the car.

**Steps in Procedure**—1. Gold copings are made for the prepared teeth and all are splinted together by soldering a special cast bar between the edentulous spaces (Figs. 3 and 4). This bar is carved from wax or plastic and designed with a small hemispheric knob located midway between the abutment teeth.

2. The bar is usually placed slightly lingual to the residual ridge and the center-poise knob is located according to the curve of Spee of the posterior ridges (Fig. 5).

3. The purpose for such placement is that normal occlusion and mastication perform the function of distributing stresses on the abutment teeth

evenly in a direction with the trabecular structure of the mandible, and tend to force the abutment teeth down into the sockets at an angle parallel to their long axis. Regardless on which side the patient chews, stress is distributed evenly between the supporting teeth and the retromolar pad on both sides.

**Splint Bar Placed**—The connecting splint bar is made fairly heavy so that it cannot be bent under pressures of mastication. It is placed in a position just off the mucosa to prevent impingement in case of settling of the abutment teeth. Settling of the abutment teeth seems to take place as the teeth are driven along their long axes into the bone.

**Changes in Bone**—X-rays reveal a definite thinning of the periodontium with an increase in the density of the surrounding trabecular bone, similar to cases found in bruxism (Fig. 6). As tapered teeth always receive the stresses of mastication (in these cases, directly parallel to their long axis), they tend to become highly immobile. This principle is synonymous or analogous to driving a tapered tool into a tapered socket—it can only tighten.

**Further Tilting Prevented**—The knob is placed on the connecting splint bar in a position corresponding with the parallel line drawn at a right angle to the bottom of the curve of Spee regardless of the labial tilt of the anterior teeth (Fig. 7). This prevents further labial tilting of these teeth and further labial bone resorption.

**Knob Prevents Torque and Leverage**—The height of the knob is such that its top is below the lower half of the crown height of the abutment teeth to prevent torque and leverage (Fig. 8).

### New Center-Poise Partial

Impressions are taken for construction of the partial. During the interim the old partial is altered to serve temporarily. The casting for the new center-poise partial (Fig. 9) is made with relief in all areas around the abutment teeth and bar to allow for movement due to compression of the tissues during eating and swallowing.

**Suspension Cup**—The center-poise suspension cup is designed so that the



**17A and 17B.**

Two views of finished partial dentures. Arrow points to sus-

pension cup or concavity in casting that rests on center-poise knob.

concavity rests on only the top of the center-poise knob; in this way pressures are always diverted directly down on the knob (Fig. 10).

**Torque Avoided by Placement of Clasps**—The clasps are two-sided, clasp on the tips only so that there is no torque. The tips of the clasps are placed in line with the curve of the ridges, preventing any rocking of the partial to place torque on the abutments (Fig. 11).

**Gold Used Below Clasps**—In order to prevent wear of the clasps on the acrylic veneers, gold is placed below the clasps (Fig. 12).

### Variation Possible

Several variations of this technique have been used, but the basic principles have been retained (Fig. 13). In

some cases the bridge is completed with acrylic teeth filling the missing spaces and the center-poise knob is placed behind these teeth (Fig. 14). The disadvantage of this method is the accumulation of food around the knob and the inaccessibility of the area for cleaning.

**Posterior Teeth Can be Used**—As shown in Figure 15, not only anterior teeth, but posterior teeth where they remain can be used. The clasping arrangement is altered for each specific type, making sure that the clasps will not place torque on the abutment teeth.

**Location of Center-Poise Knob**—Figure 16 shows how the position of the center-poise knob is determined. Imaginary lines are drawn criss-cross through the abutment teeth to determine center of balance as indicated by

the arrow. This places stresses evenly upon all remaining teeth.

**Posterior Alveolar Ridges Maintained**—The finished partial denture extends well up onto the retromolar pads taking advantage of as much bone coverage as possible (Fig. 17). This has the added advantage of giving the remaining posterior alveolar ridges necessary exercise to maintain health.

### Conclusion

The author proposes this new method as a solution to what would otherwise be difficult and hopeless cases (Figs. 18 and 19). Results have been completely satisfactory over a period of four years.

920 Winton Road, South



**18.**

View of gold copings in place before soldering on splint bar and center-poise knob. Complete destruction and resorption of posterior ridges have occurred. The teeth were highly mobile and if extracted would have presented a most difficult



case for conventional full dentures.

**19.**

Completed case in mouth.

# TREATMENT OF UNERUPTED INCISORS:

## Report of a Case

LOUIS B. KELSTEN, D.D.S., Newark, New Jersey

### DIGEST

Injuries to the deciduous incisors are common. Such trauma frequently disturbs the normal growth and development of the permanent teeth. This is a report of a case of conservative management of the unerupted permanent central incisors that were injured during the developmental stage.

### History

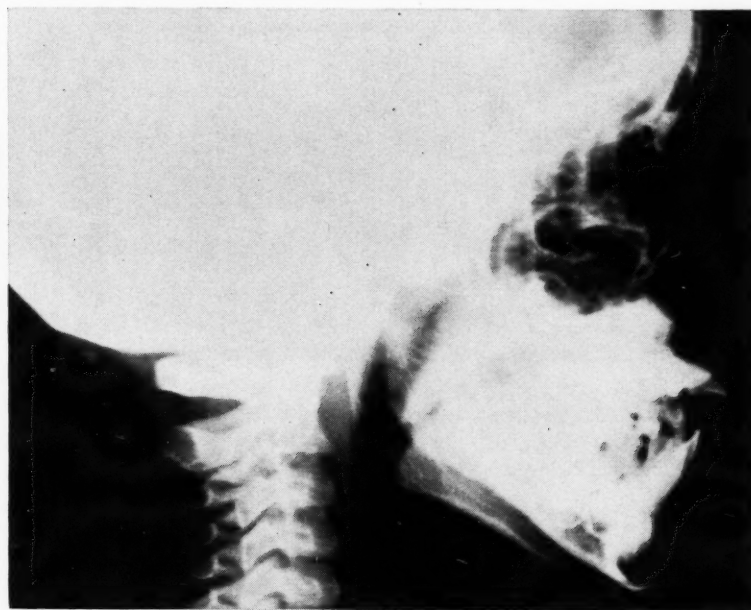
On November 15, 1956, a seven-year-old boy was brought for consultation concerning two upper impacted central incisors. The child's history re-



1. Intra-oral x-ray showing dilaceration and displacement of the upper right central. (Taken November 15, 1956.)



2. Intra-oral photograph: Note the bulge of mucous membrane of unerupted upper left central. Upper right deciduous lateral exfoliated just before the picture was taken. (November 15, 1956.)



3. Profile head film revealing horizontal position of upper central incisors. (Taken November 15, 1956.)

vealed that at the age of three he had fallen and injured the upper deciduous centrals which shortly afterward became acutely infected and were therefore extracted. At present the up-





**4.**  
*A band was cemented to the exposed left central; nylon elastic thread was tied from arch to lingual and labial band attachments. (Taken November 18, 1956.)*



**5.**  
*An intra-oral photograph was taken February 6, 1957, after the right central was tied to the labial arch. Note nylon elastic tied to the lingual eyelet from the lingual arch.*

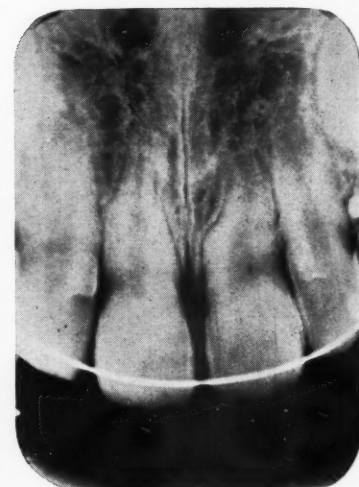
per centrals were displaced in a horizontal position and were blocking the upper laterals, and the root of the upper right central appeared malformed. The family dentist had therefore sug-

gested that both centrals be extracted (Fig. 1). The parents opposed the extraction of the centrals, however, and the boy was brought to the author for consultation.

## Results of Clinical Examination

1. As shown in Figure 2 a pronounced bulge of the upper left central could be readily palpated through the mucous membrane.

2. A profile head film of the patient (Fig. 3) confirmed the horizontal position of the upper centrals.



**6 and 7.**  
*X-rays taken May 1, 1957, and October 23, 1957. Note the continued improvement of the root formation of the upper right central.*

3. Since the upper right central revealed a marked dilaceration, the parents were told that an attempt would be made to move the upper left central into position, and an attempt would



then be made to save the malformed upper right central.

4. It was suggested that the boy be taken to an oral surgeon to expose the upper left central and later the upper right central so that these teeth could be banded for orthodontic movement. To this the parents consented.

#### Procedure Followed

1. Three days after the patient was first seen the upper left central was exposed and banded.

2. Because the crowns of the upper six-year molars were only partly erupted, the second deciduous molars which were firm and had fairly long roots were banded.

3. A removable .030-inch thick lingual arch was inserted into the lingual tubes of the molar bands; also, a .020-inch thick labial arch was inserted into the buccal molar tubes and nylon elastic threads were tied from the arch to the labial bracket and the lingual eyelet of the band which was cemented to the exposed tooth (Fig. 4).

4. Six weeks after the upper left central had been moved into a more normal position, the upper right central tooth was exposed, banded, and tied to the labial arch with a nylon elastic thread.

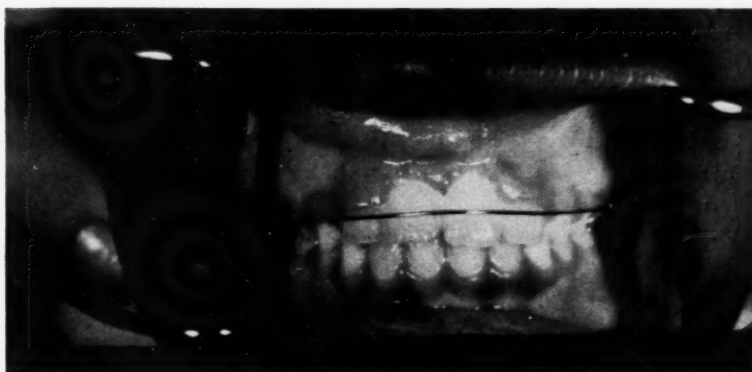
5. A month later, after the right central had been moved sufficiently so that it could be ligated to the labial arch, a nylon elastic thread was inserted into its lingual eyelet and tied to the lingual arch in order to move it more lingually (Fig. 5).

#### Results of Treatment

Three months after both teeth had been moved to a more normal position, an x-ray was taken. The improvement in the root formation of the upper right central is shown in Figure 6.

**Bands Removed**—Five months later, the incisor bands were removed and a new labial arch .020 inch thick was placed in position to act as a retainer. An x-ray of these teeth was also taken on this day (Fig. 7). Note the marked improvement in the root formation of the upper right central.

**Progress Shown in Photographs**—Approximately three weeks after the x-ray was taken, an intra-oral photo-



8. Intra-oral photograph (November 11, 1957) showing the normal eruption of the lateral incisors.



9. Profile x-ray view of the patient November 11, 1957. Note improved position of the upper central incisors.

graph (Fig. 8) and a profile head film (Fig. 9) were taken showing the normal eruption of the laterals and the improved position of the upper central incisors. Fourteen months after the patient was first seen, all appliances were removed.

**Final Observation**—When the patient was last seen almost three years later his incisors, cuspids, and bicuspids were in good occlusion.

#### Conclusion

Although apparently malformed and displaced, unerupted young incisor teeth should be saved if possible, since their incompletely calcified roots are amenable to orthodontic treatment. Moreover, preservation of these teeth can prevent severe complications in the occlusal development of the teeth.

31 Lincoln Park

# WAX BITE Technique

IRVING A. ELLMAN, D.D.S., New York

## DIGEST

*An accurate wax bite is required if a crown or inlay is to fit its neighboring and adjacent teeth properly. This article describes a method of taking a wax bite which makes it possible to overcome difficulties and inconveniences often encountered in conventional bite registration techniques.*

## Advantages of the Procedure

This technique provides the following advantages:

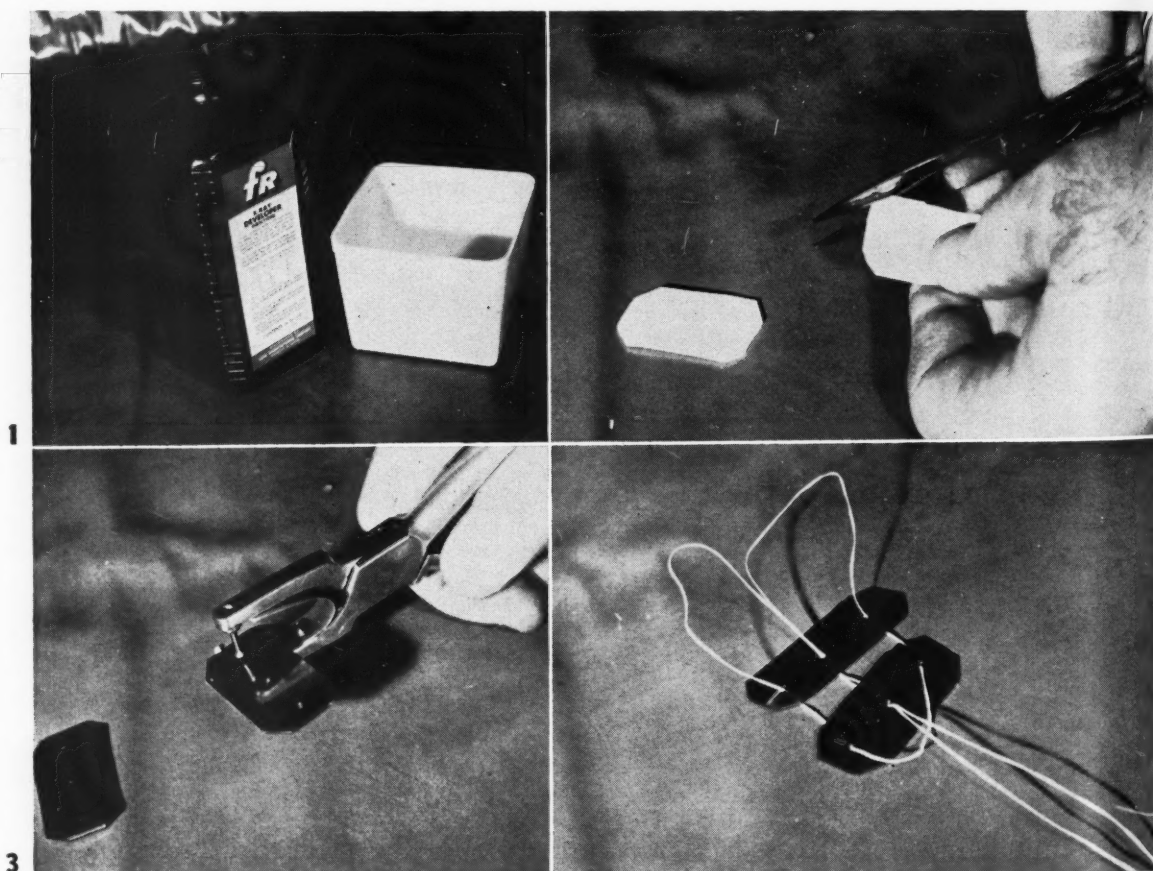
1. Compression of the wax on the lingual aspect is obtained without cooperation of the patient.
2. The technique requires less time to complete.
3. The teeth seem to be guided into correct centric by the buccal and lin-

gual polyethylene plates.

4. The resulting impression and models are more accurate and have a more finished appearance.

## Technique

The technique makes use of a buccal and lingual plate of polyethylene laced together with a piece of braided nylon (fishing cord) which passes through three holes in each plate.

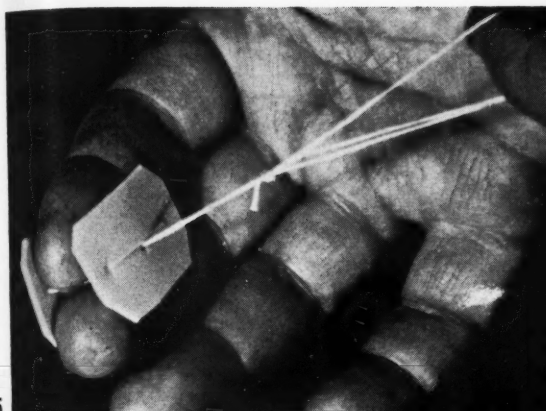


**1.**  
*Suitable plastic can be obtained from bottles or refrigerator containers.*

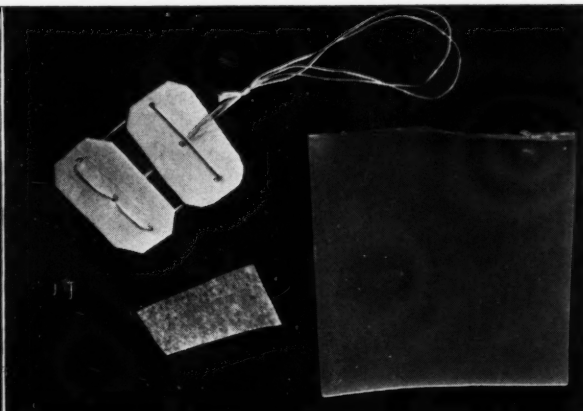
**3.**  
*Punching three holes with the rubber dam punch.*

**2.**  
*Cutting the plastic plates.*

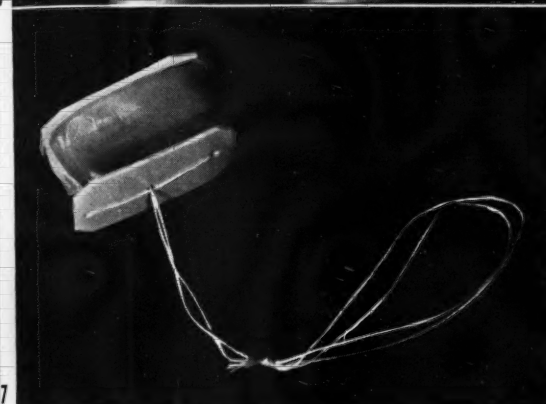
**4.**  
*The plastic plates are laced together with the nylon string.*



**5.**  
*Showing the loop helping to exert a positive pull on braided nylon resulting in both plates compressing the fingers.*



**6.**  
*The laced plates, wax, and tissue paper spacer.*



**7.**  
*The plates are filled with warmed wax.*



**8.**  
*The bite is in place in the mouth with the loop being pulled to compress the wax.*

With the two polyethylene plates laced in this manner, pulling on the loop not only draws the lingual plate up against the teeth, but also compresses the buccal plate where it is needed most. The compression is evenly distributed from one end of the plates to the other. To complete the procedure the following steps may be taken:

1. Two pieces of polyethylene, easily obtained from bottles or refrigerator containers (Fig. 1) are cut into flat pieces, approximately  $1\frac{1}{4}$  inches by  $3\frac{1}{4}$  inches with rounded corners (Fig. 2).

2. Three holes are punched in each plate with the largest hole of a rubber dam punch. A large round bur can be used equally well (Fig. 3).

3. Two plates are laced together as shown in Figure 4. The end of the

braided nylon is finished with a loop so that a strong pull can easily be applied.

4. A pull on the loop compresses both buccal and lingual plates as shown in Figure 5 and also tends to encourage the lingual to follow the curved arch.

5. A sheet of hard pink wax is shown in Figure 6. For separation between the upper and lower layers a piece of tissue paper, rather than tin foil may be used to separate the wax. With the tissue paper it is possible to hold the finished bite up to the light and examine for sufficient occlusal space over the preparation.

6. The softened wax is placed between the two plates with the tissue paper touching the nylon string (Fig. 7).

7. After the wax is reheated the

block is placed between the teeth with the nylon loop on the buccal side (Fig. 8).

8. The patient closes the teeth while a visual check is made of the teeth on the opposite side.

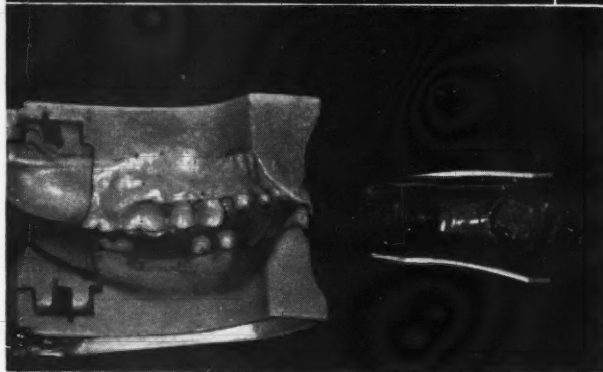
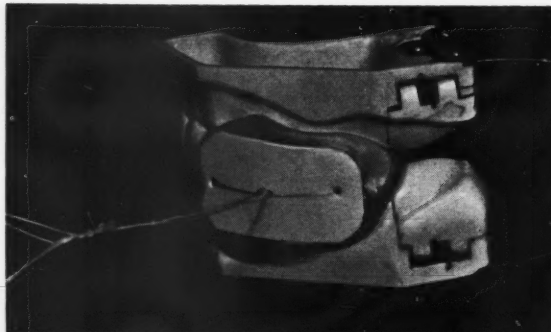
9. Pull the nylon loop firmly, while applying pressure on the labial (Fig. 9). The polyethylene plates compress the wax into the following spaces:

(a) Between the prepared tooth and the opposing one.

(b) Mesially and distally, between the prepared tooth and the proximal surface of the adjacent teeth.

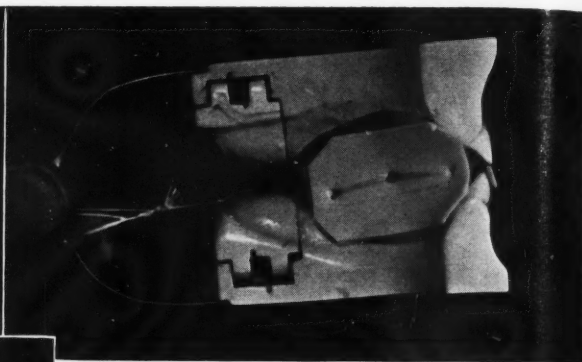
(c) Buccally and lingually around the prepared tooth, to provide an impression for seating the die accurately.

10. The wax bite is chilled while the teeth are still closed. It is held firmly against the jaw containing the prepared tooth. When the patient sep-



**9.**  
*The buccal plates are adapted to the outer convex curvature of the arch.*

**11.**  
*The detail is produced in the finished bite by the positive compression force of the bite technique.*



**10.**  
*The lingual plate is adapted to the concave surface of the arch.*

arates the jaws the opposing teeth come out of the wax and the wax bite remains in position against the prepared tooth. The half-open bite can now be chilled again and the wax bite can then be removed. If this procedure is not followed carefully, the wax bite may stick to the jaw opposite the prepared tooth, and the wax which is between the prepared tooth and its adjacent contact points will be withdrawn in a curved direction and become greatly distorted, resulting in poor contact points.

11. Hinged articulators are preferred as incomplete closure of the patient's jaws can be compensated by closing the articulated models until

the teeth, mesial and distal to the prepared tooth, contact the opposing teeth.

12. If the wax bite is removed from the models with warm water the wax can be separated from the polyethylene plates without destroying the nylon stringing, making it possible to reuse the bite tray several times.

### **Method to Control Contact Points**

It has always been more desirable to obtain a plus contact point on the finished casting, reducing it in the mouth by grinding and polishing, rather than to obtain a minus contact point which must be built up by the

addition of solder. Scraping the proximal surface of the tooth next to the prepared tooth, will result in plus contact but since the term scraping can mean anything from a thousandth to a sixteenth of an inch, the following method is suggested to encourage tightness of contact point:

1. The proximal surface is blackened with pencil and then scraped lightly until the pencil mark is erased. This is repeated twice.

2. If the finished castings are too loose, a third scraping will result in tighter contact points.

3. If the castings are too tight, one less scraping will result in looser contact points.

### **Conclusion**

Do not underestimate the value of the wax bite. It is fully as important as the impression of the tooth. The outer contour of the finished casting can restore tight contact points and proper occlusal chewing efficiency, or can result in a chronic source of food impaction. The wax bite technique described here exerts many pounds of compressive force and adapts the wax so intimately to the teeth that the finished castings will satisfy the dentist and the patient.

133 East 58th Street



# A Simplified PULPOTOMY TECHNIQUE

JAMES J. PRYOR, D.D.S., Augusta, Georgia

## DIGEST

*The retention of deciduous molars until they are exfoliated is an important objective. An aid in attaining this goal is the use of pulpotomy, which consists of the removal of the coronal portion of the pulp of the tooth. This article describes a procedure which is rapid, requiring 2 to 5 minutes to complete; simple, using one layer of cement; and effective, producing no failure in 239 cases employing the technique.*

## Extraction Frequently Preferred

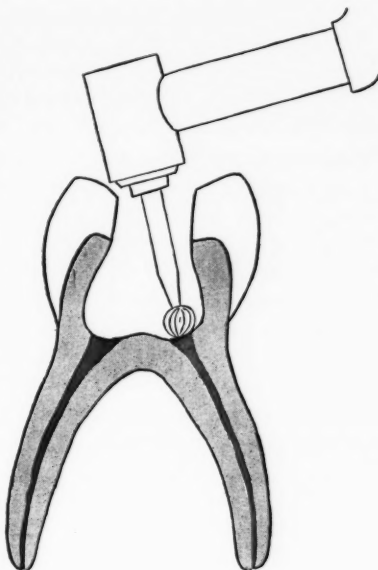
Pulpotomy therapy apparently has not been widely employed by the dental profession. Many dentists utilize pulp-capping procedures in cases of small exposures on deciduous teeth, but often extract the tooth if there is a large carious exposure. In many cases of extracted teeth no effort is made to maintain the space which was occupied by the deciduous tooth. The complicated techniques recommended by most dental textbooks and clinicians may account for failure to utilize pulpotomy procedures.

## Problems Involved In Use of Space Maintainers

Although space maintainers often serve to maintain the space created by an extracted deciduous tooth, probably no space maintainer is as efficient as the tooth itself. There are, also, problems involved in the use of space maintainers: (1) the cost, (2) periodic observation for proper function, (3) removal at the proper time to provide space for the permanent teeth, (4) recementation in case the appliance loosens.

## Simple Method Evolved

Pulpotomy is one means of retaining a deciduous molar that has a large



**1.**  
*Cavity preparation and removal of coronal pulp tissue are completed with a No. 6 round bur in an air turbine handpiece.*

carious exposure and is contraindicated for pulp capping. A technique has been developed for performing pulpotomies in a rapid, simple, yet effective manner. A rubber dam is not used and no attempt is made to protect the operation site from the patient's saliva. The entire procedure, exclusive of the restoration of the tooth, requires from 2 to 5 minutes. Teeth that formerly were contraindicated for pulpotomy therapy may be effectively treated by this new method.

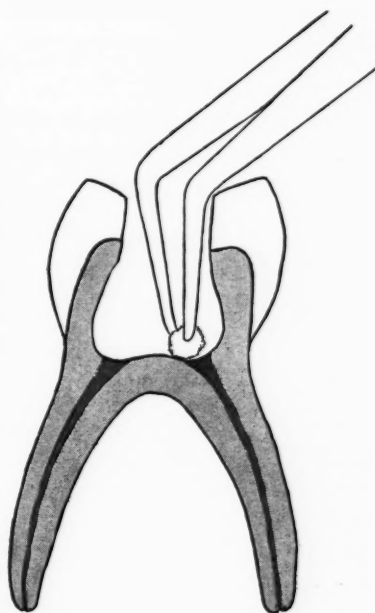
## Procedure

The air turbine type of dental handpiece was used. Most of the grinding was done with the No. 6 round bur under local anesthesia. The entire roof of the pulp chamber and all of the pulp tissue is removed in less than a minute with the No. 6 bur, leaving the pulp

stumps exposed where they were amputated at the floor of the pulp chamber.

**Operative Problem — Hemorrhage** is the major difficulty encountered. Monsel's solution (ferric subsulfate solution) is utilized to overcome this obstacle. A small amount of Monsel's solution on a cotton pellet is applied directly to the bleeding pulp stumps. This produces an unsightly dark brownish coagulum covering the pulp residual tissue. Most of this coagulum should be left undisturbed; removal from the exposed pulp tissue often results in resumption of the hemorrhage. In difficult cases a second application of the Monsel's solution may be necessary.

**Cement Used to Cover Coagulum —** When the bleeding has ceased a small amount of cement, measuring 1 to 2 millimeters in thickness, is flowed over the coagulum that covers the pulp end-



**2.**  
*A pellet of cotton containing Monsel's solution is applied to pulp stumps to stop bleeding.*

ings. The cement used in this study is a commercial preparation called Cavitec®. This product is described as "essentially a zinc oxide-eugenol paste containing a sulfa derivative." The product comes in two tubes, a base and an accelerator. This cement was selected because of its ease of manipulation, radiopacity, and ideal setting time. Other sedative or pulp-capping cements may serve equally well. Possible effects of the sulfa derivative on any bacterial components of the root canals will not be considered.

**Restoration of Unusual Strength**—Since little space is occupied by the cement, a large quantity of amalgam will be required to restore the tooth. This results in a restoration of notable strength because of the thickness of the restoration material. The large bulbous opening into the pulp chamber affords a mechanical lock and ideal retention. Teeth with extensive caries that previously required crowns can be treated easily and effectively by this method because of the intracoronal retention afforded by the restoration material in the pulp chamber.

**Additional Cement Found Unnecessary**—An additional layer of zinc phosphate cement to support the pressure required when condensing amalgam has been recommended. In this study the zinc phosphate cement was found to be unnecessary. The additional layer of cement presents the fol-

lowing disadvantages: (1) the time required for the treatment is almost doubled, (2) the thickness or bulk of the amalgam restoration is reduced resulting in a weaker restoration, (3) the intracoronal space that provides most of the retention for the amalgam restoration is reduced.

**Local Anesthetic Used**—As long as profound anesthesia was obtained there was no more sensitivity from the extirpation of the vital pulp tissue than was experienced in the removal of the dentin of the tooth.

**Cases Remain Asymptomatic**—The study reported here includes 239 teeth treated during a sixteen-month period by the method described. None of these patients (or their parents) has reported postoperative pain, tenderness, or thermal sensitivity. All cases have been completely asymptomatic after treatment.

**Postoperative Observation**—The first group of patients returned for three-week follow-up examinations. Later, because of the absence of failures in any of the cases treated, the patients returned for routine six-month examinations. Parents were advised to bring children to the office immediately in case of pain, tenderness, thermal sensitivity, swelling or any other symptoms considered abnormal.

**Minimum Radiation Dosage Received**—The only radiographs taken on these patients were the routine bite-wing films taken initially on new child patients and those taken at six-month intervals to detect interproximal caries. Initial and follow-up periapical radiographs would have been helpful in evaluating the results of this study. They were not taken because of the desire to minimize the radiation dosage received by young patients.

### Selection of Teeth for Treatment

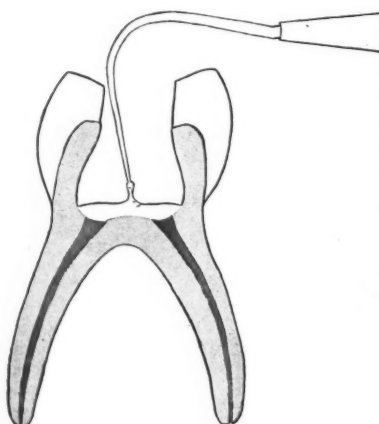
Sixty-six of the cases were treated contrary to generally recognized indications for pulpotomy therapy. This was done in order to determine the types of teeth that would be contraindicated for the particular treatment. A tooth that became tender, painful, or showed signs of active infection such as swelling or purulent drainage was

to be considered a therapeutic failure.

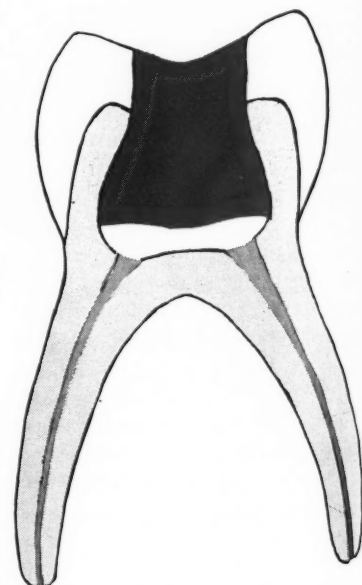
**First Group of Doubtful Cases**—Twenty-eight teeth with necrotic or gangrenous pulps were the first doubtful cases selected. The pulp chambers of these teeth were either dry or contained a softened mass or a liquid. Some of the teeth presented no painful symptoms, whereas others were sensitive to hot liquids or exhibited various degrees of tenderness to biting pressure or percussion. These teeth were treated in the same manner as the others except that the Monsel's solution was not used since there was no bleeding. After treatment, none of the complications enumerated was observed. The symptoms of thermal sensitivity and tenderness disappeared.

**Second Group of Doubtful Cases**—The next doubtful group selected comprised twenty-three children who presented pulpitis. These cases exhibited inflammatory changes within the pulp, as distinguished from those affecting the periapical tissues. The teeth responded favorably to pulpotomy therapy; the painful symptoms related to the inflammatory changes within the pulp disappeared.

**Third Group Selected**—Because of the apparent success from the previous doubtful cases, it was decided to evaluate this technique in treating teeth



**3.**  
A thin layer of Cavitec® cement is applied to the floor of the pulp chamber, covering exposed pulp tissue of the root canals.



**4.**  
Amalgam restoration is inserted over a single layer of cement.



5A.

Thirteen months postoperative film on the first case treated utilizing the new pulpotomy technique.



5B.

Twelve months after treatment showing healthy condition around two teeth that are maintaining the space needed for their permanent successors.

with acute alveolar infection. Fifteen cases were treated with the same degree of success as that obtained in the previous cases. In some of the cases, drainage of the swollen overlying apical tissues was obtained by incision after the pulp chamber had been debrided. Postoperatively, the painful symptoms subsided, swelling disappeared, and after several weeks extremely loose teeth became firm.

### Discussion

This study is incomplete and the success attained, although without evident failures, is based solely on clinical observations. The simplicity of the treatment, as well as the unusual degree of success experienced, should warrant further study by those qualified to evaluate histopathologic changes resulting from the therapy described.

**Problematic Situations**—Most of the cases in this study no doubt are left with healthy vital pulp tissue in

the root canals. The eventual condition of the cases with gangrenous pulps and acute alveolar infection is in question. Many of the teeth treated obviously retain infected root canals, even though the coronal portion has been mechanically obliterated. The future condition of the periapical tissues and the possibility of remaining asymptomatic are also problematic.

**Autocontrol of Infection**—The pulp chambers of deciduous teeth are large in comparison with the size of the crowns. The elimination of this large amount of space from the total size of the pulp cavity allows the defensive forces of the organism to control more efficiently any infection present. Apparently the child's body is capable of keeping under control any irritation that arises from the pulp tissue that remains in the small root canals. The large space occupied by the coronal pulp, however, affords a much larger and more distant refuge for bacteria to accumulate and multiply. In many cases, this coronal space seems to be enough to overcome body defensive forces and produce acute inflammatory changes. Without this coronal pulp tissue, the infection apparently is controlled, acute inflammatory reactions are prevented, and the tooth remains asymptomatic.

**Defensive Reaction to Irritation**—Granulomatous tissue will probably make its appearance around the apex of some of these teeth. Many of these granulomas will be so small that detection radiographically may be difficult. This tissue occurs as a defensive reaction to control the irritation that may arise from bacteria or toxic products that may arise from the root canal. Current literature reveals that most granulomas are sterile and also that they may occur in the absence of infection.

### Summary

A technique has been presented for performing a simple, nonsterile pulpotomy that requires from 2 to 5 min-



5C.

Eleven months after treatment. The two teeth shown were virtually without coronal tooth structure after removal of caries. The intracoronary retention afforded by the bulbous outline form of the portion of the tooth that previously was the pulp chamber made possible the relatively simple restoration of these teeth with amalgam.



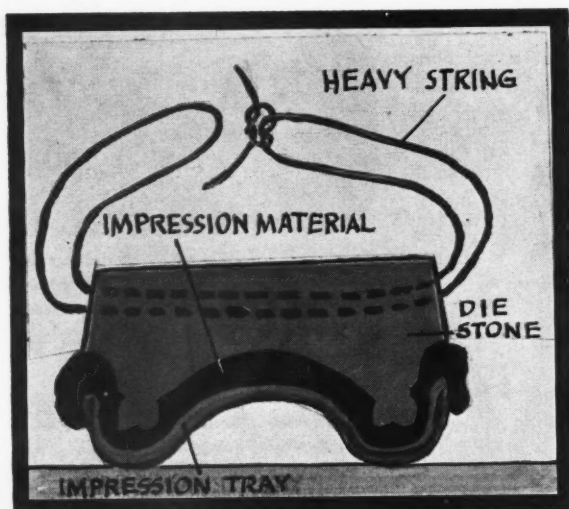
5D.

Another case revealing results fifteen months after pulpotomy.

utes operating time. Because contraindications to this technique have not been evident the author has been able virtually to eliminate the extraction of deciduous teeth. To date this treatment has been clinically successful in treating teeth with (1) large carious exposures, (2) necrotic or gangrenous pulps, (3) pulpitis, (4) acute and chronic alveolar abscesses. The 239 cases in this study provided no failure, as evidenced by swelling, tenderness, pain, or drainage. Clinical observations alone do not determine that a particular procedure is successful. A clinically successful case may be a failure when assessed histologically. Further study is required for a more thorough evaluation of the results obtained by this treatment.

1721 Central Avenue

1



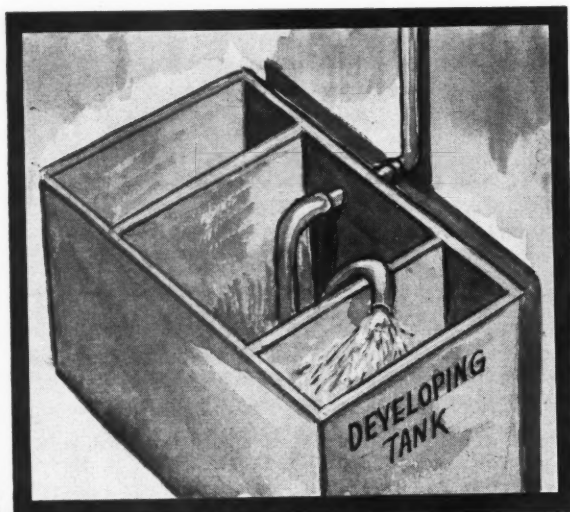
## Clinical and Laboratory

### Model Recovery

Capt. Robert W. Weinrich, (DC), Naselle AFS, Washington

1. To facilitate recovery of the model from an elastic impression, a loop of heavy wet cord can be embedded in the stone during the pouring. This will be a handle for easier separation. The second poured model will have less distortion than if the impression was heated for model removal.

2

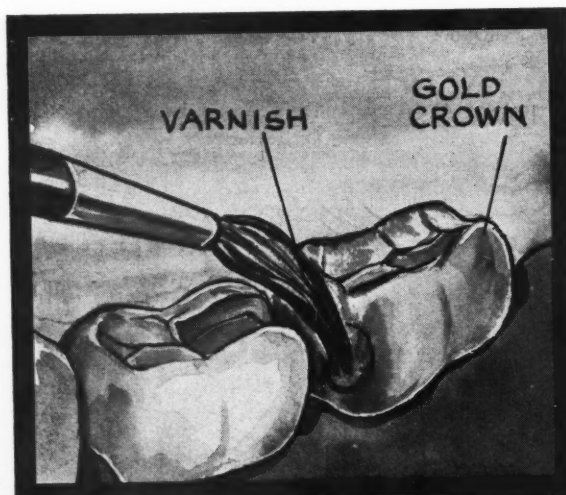


### Method of Rinsing X-ray Tank

Paul J. Minehart, D.D.S., Catonsville, Maryland

2. X-ray processing tanks should be washed frequently. The washing may be facilitated by placing a length of rubber hose over the water outlet inside the tank and using this as a spray.

3



### Control of Galvanic Shocks

Stewart Stempel, D.D.S., Brooklyn, New York

3. To reduce the electrogalvanic action between amalgam and gold when inserting proximal amalgam restoration paint the gold restoration with dental varnish.

### READERS are Urged to Collect \$10.00

For every practical clinical or laboratory suggestion that is usable, DENTAL DIGEST will pay \$10 on publication. You do not have to write an article. Furnish us with rough drawings or sketches, from which we will make suitable illustrations; write a brief description of the technique in-

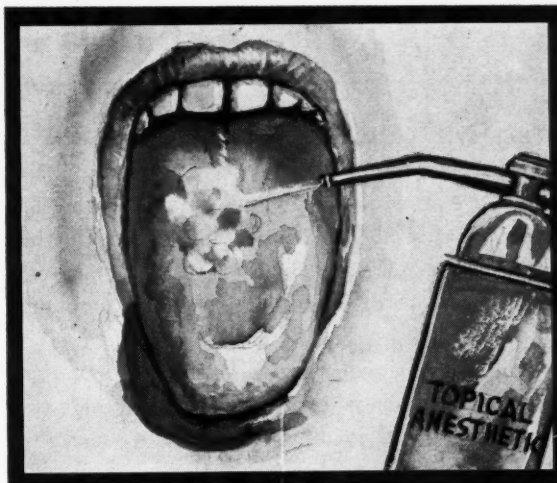


## SUGGESTIONS . . .

### Topical Application of Stannous Fluoride

William Robbins, D.D.S., San Francisco

4. To mask the unpleasant taste of stannous fluoride, spray or dab a topical anesthetic on the child's tongue before applying the stannous fluoride solution to the teeth.

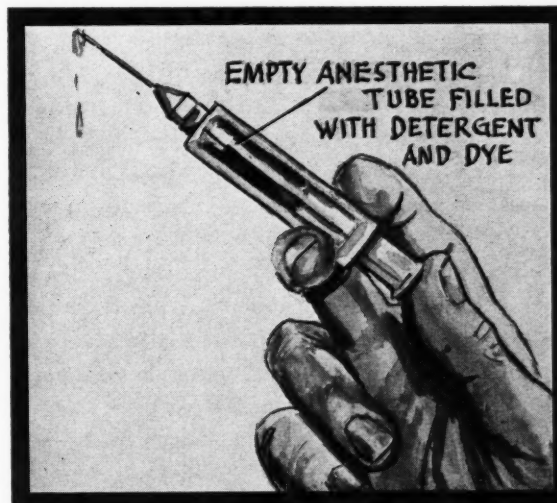


4

### Cleaning the Lumen of Needles Before Sterilization

Henry Heimansohn, D.D.S., Danville, Indiana

5. An empty anesthetic tube is filled with a detergent and a dye and the solution is ejected through the needle prior to sterilization by boiling or autoclaving. The dye is used to prevent using the solution for injection into tissue.



5

### Polishing Crowns and Inlays

M. D. Gruber, D.D.S., Sac City, Iowa

6. Hold the crown or inlay with wet cotton. This procedure assures a firmer grip and prevents burning the fingers from the frictional heat of polishing.



6

involved; and jot down the advantages of the technique. This shouldn't take ten minutes of your time. Turn to page 442 for a convenient form to use.

Send your ideas to Clinical and Laboratory Suggestions Editor, DENTAL DIGEST, 708 Church Street, Evanston, Illinois.

## The EDITOR'S Page

WHEN BONE grafts have been used to restore the tissue that has been lost in periodontal disease the results have not always been favorable. Kromer, however, has described a surgical procedure in which favorable results were obtained in 23 of 30 cases in which granules of cancellous bone were implanted in periodontal pockets.<sup>1</sup>

These homogenous grafts were made from bone removed from the ribs prior to heart surgery, from resected femoral heads, and from the iliac crests. The preservative used was a 1:1000 aqueous solution of merthiolate.

Immediately before the operation the larger bone fragments were divided into grain-sized chips and stored in a physiologic salt and Terramycin® solution (Terramycin 250 milligrams in 100 milliliters of .9 per cent saline). Per oral antibiotic treatment was also used before and after the operation.

"After incision and reflection of the mucoperiosteal flap a thorough curettage was performed, for the purpose of removing granulations, pocket epithelium, calculus, and the outer layer of the cementum. The area was irrigated with physiologic saline and packed with cancellous bone chips. In half of the cases 1 milliliter of thrombin was pipetted into the area of operation, whereupon the flap was replaced and sutured. Surgical cement was placed in the interproximal space in order to protect the blood clot. The sutures were removed after an interval of from 5 to 7 days.

"The patient was instructed to keep the area as clean as possible, using a soft tooth brush and a rubber dental stimulator. Chewing on the teeth involved was to be avoided for the first week.

"No probing was done until the elapse of three months. Pocket depth was noted before the operation and at the three-and six-month follow-ups and thereafter once a year, roentgenograms being taken at the same time. Gingival inflammation and retraction, and tooth mobility were also recorded."

Cancellous bone is used rather than cortical bone because revascularization proceeds ten times faster and the hazard of infection is reduced. The ideal graft would be autogenous (removed from the pa-

tient himself). Homogenous grafts (from other human beings) were those used in the procedure described by Kromer. Heterogenous grafts (from other species) are never indicated. The speed of vascular penetration, which is the measure of possible success of this surgical procedure is autogenous, 6; homogenous, 3; heterogenous, 1.

The biologic rationale and sequence of events in bone grafting are described:

"After the organization of the blood clot, proliferation of osteoid tissue commenced, both in the periphery of the blood clot and along the surfaces of the bone graft. The process of apposition of bone, replacement of the adjacent grafts and calcification of osteoid tissue proceeded during the weeks following the grafting. At present, bone formation in grafting is incompletely understood. In these histological preparations, osteoclastic activity was infrequently observed, except in the early phase, during the *transformation* of the graft. This is in agreement with the observations of Reynolds, et al. In the remodelling of the new bone, however, osteoclastic activity was more pronounced. The duration of the process of replacement of the graft was variable.

"The *type of host bed* as well as the *size of the graft* appeared to be of importance. For example, the grafts of 93 days' duration were completely replaced, while remnants of the 98 days' graft could still be seen. The 93 days' grafts were inserted into two-walled bone defects and the 98 days' grafts in a supracrestal pocket, the latter resembling an onlay graft with only a small contact with the host bone (shelf-like crest). The small contact area and the size of the graft might have been the causes of the prolonged healing time in this case. The larger the contact surface between the graft and the host bone, the more rapid is the fixation and replacement of the graft. A three-walled infra-bony pocket, therefore, provides the most suitable bed, offering a large contact area and, at the same time, protection of graft and blood clot."

The roentgenograms that show bone regeneration are solid evidence that this surgical method has important clinical application in periodontal therapy. The surgery should be done under hospital conditions.

<sup>1</sup>Kromer, Heyman: Bone Homografts in the Surgical Treatment of Cysts of the Jaws and Periodontal Pockets, Oslo, Norway, Oslo University Press, 1960.



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## Alcoholism

Alcoholism is not rare. One of sixteen adult drinkers may become an alcoholic. There are approximately 4,000,000 problem drinkers in the United States. Unless treated many persons become progressively worse leading to their ruin both as persons and as members of society.

A chronic alcoholic is an addict who can be recognized by his uncontrollable desire for alcoholic beverages. He continues to use alcohol even when it interferes with his health and his success. He drinks excessively although alcohol alienates him from the members of his family, interferes with and jeopardizes his job, and even injures his position in society. When such a patient takes one or two drinks, he either finds it impossible to stop or refuses to do so. Usually he has lost all control of his drinking habits.

The response to fear is anxiety or tension, and alcohol is one of the devices used by man to minimize these uncomfortable feelings. The action of alcohol releases the subject from his uneasy state and makes him feel content, even if his contentment is only temporary and exists on an illusory basis. Finally, in the confirmed alcoholic, the cells of the body and particularly those of the brain become changed. They function better with alcohol than without it, for the sudden withdrawal of alcohol excites abstinence symptoms including weakness, tremor, and perspiration.

Alcoholic fluids are taken chiefly for their action on the brain. Alcohol achieves these effects by depressing and by obtunding brain function and consequently muffling the mind. All parts of the brain are necessarily affected, but the symptomatology reveals that the areas of the brain first to be involved are those of cerebral cortex. With increasing amounts, the dulling effect of alcohol gradually descends until it finally envelopes the entire brain including the medulla oblongata. Because of this pattern of depression, alcohol has its earliest and greatest action on cortical functions,

## MEDICINE

### and the

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whereas such fundamental processes as respiration may be maintained for a long time after the intoxicated person has become stuporous. The earliest depressive effects of alcohol involve intricate correlations rather than the more simple processes.

*Himwich, Harold E.: The Management of Alcoholism, Mod. Med. 27: 23-32 (November 1) 1959.*



### Acute Brain Syndromes

With acute brain syndromes, diffuse impairment of cerebral function occurs. Delirium and other defects of sensorium are the most common manifestations, but delusions and other behavior disturbances may be superimposed. Full recovery is expected in most, but not all, patients.

Excluding delirium tremens and alcoholic hallucinosis, convulsive disorders, and drug or poison intoxication are most common causes. Circulatory disturbances, systemic infections, and head trauma are also important. The etiology is unknown in 13 per cent of

patients at the onset, but careful study may reveal the cause for about half of the unexplained syndromes.

Acute brain syndromes are most common in the fourth and fifth decades of life. Men are affected more often than women. Patients are frequently disoriented, more often for time than for place. Memory impairment takes several forms. Diffuse loss of recent and remote memory and of immediate retention and recall may occur, but isolated defects in recent memory are just as frequent. Confabulation may also occur. Hallucinations are noted in slightly over half the patients and auditory hallucinations are more common than visual.

Delusions are as frequent as hallucinations and ideas of persecution predominate. The most frequent disturbance in affect is a shallow, constricted, or flattened feeling tone. Depression is the most common mood disturbance. Psychomotor activity is increased and anxiety and irritability may be observed.

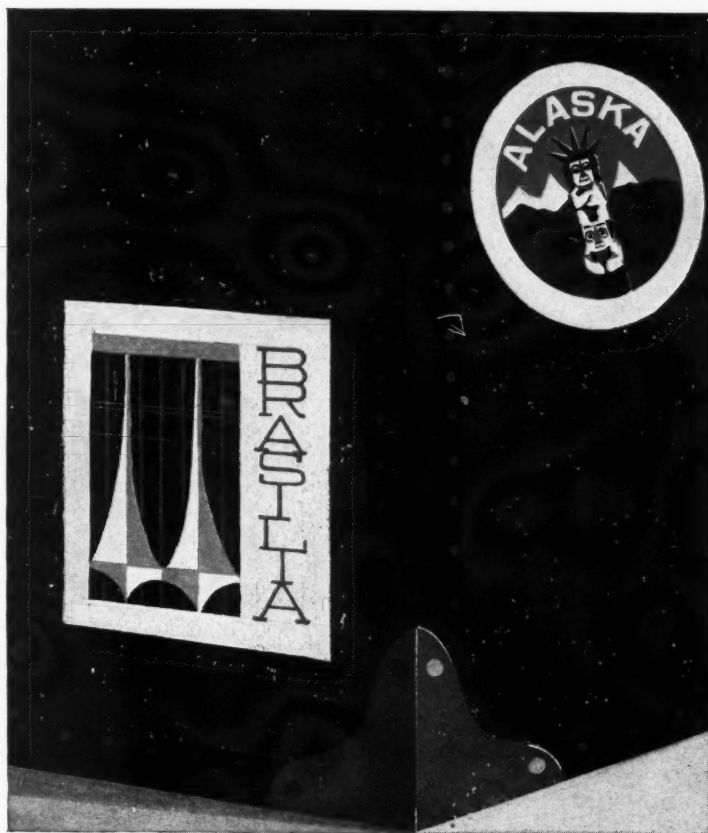
Acute delirium is not an innocuous illness. While most patients recover during hospitalization, 20 per cent have persistent disturbances of orientation, mood, affect, and memory. The death rate is 12 per cent and the patient is more likely to die if the cause is unknown. Wernick's encephalopathy, frontal lobe abscess, tuberculous meningitis, and cerebrovascular accidents of unknown etiology may be found at autopsy examination of patients.

The differential diagnosis usually includes schizophrenia, delirium tremens, and alcoholic hallucinosis. The last may be particularly difficult to distinguish from acute brain syndromes associated with convulsions and trauma, for many patients have an alcoholic background. Previous hospital admissions for delirium tremens or alcoholic hallucinosis and suicidal ideas and behavior may be noted.

Combined treatment by several specialists may be necessary. Patients with delirium due to systemic infections may not have fever, and symptoms in alcoholic patients may be

(Continued on page 442)





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ascribed erroneously to delirium tremens. A careful search for curable disease should be made whenever a patient with an acute mental illness exhibits impaired memory, orientation defects, somnolence, changing levels of consciousness, coma, and semi-coma.

Farber, Irving J.: *Acute Brain Syndrome, Dis. Nerv. System* 20:296-299 (February) 1959.



### Unrecognized Myocardial Infarction

The ante-mortem diagnosis of myocardial infarction is frequently missed. Probably the most important reason for failure to recognize healed or acute infarct is the lack of prolonged thoracic pain during the attack of angina pectoris.

With healed infarcts, pain is reported almost twice as frequently by patients who are seen repeatedly as by those who are examined only during the terminal illness, which is often unrelated to the coronary disease. Often postmortem examination discloses gross myocardial scars and extensive evidence of coronary atherosclerosis.

Thoracic pain accompanies most acute myocardial infarctions but fre-

quently is neither severe nor prolonged. It is, therefore, easily overlooked and forgotten by the patient. Awareness of pain may be blunted because consciousness is frequently clouded during fatal myocardial infarction. Impairment of cerebral circulation may result from concomitant infarction in the brain, diminished cardiac output, or hypotension after extensive hemorrhage, operation, or spinal anesthesia. Narcotics given for postoperative pain may mask cardiac pain. Also, fatal myocardial infarction may occur during the course of uremia, diabetic coma, or other metabolic disturbance that impairs cerebral function.

Acute or healed infarcts are more frequently recognized ante mortem than are patchy and subendocardial lesions. Of the transmural infarctions, those located laterally are the ones most difficult to diagnose. Lateral and posterior subendocardial infarcts are most often missed. These differences in frequency of recognition are unrelated to the incidence of pain. Likelihood of electrocardiographic diagnosis is increased when infarction occurs anteriorly.

The ratio of men to women is about the same for patients with recognized acute infarcts as for those with unrecognized acute infarcts. The average age of patients with unrecognized in-

farcts is about four years greater than that of patients with correctly diagnosed infarcts. An old infarction does not facilitate diagnosis of a new episode, particularly if the original infarct was not diagnosed.

The predominant symptom at the onset of acute infarction among patients with correct ante-mortem diagnosis is chest pain. Nearly all patients with cardiac pain have had angina previously. Most of the patients with recognized lesions are at home at the onset of infarction. The diagnosis is most frequently missed in patients being studied for other diseases and in postoperative patients.

Johnson, William J.; Anchor, Richard W. P.; Burchell, Howard, B.; and Edwards, Jesse E.: *Unrecognized Myocardial Infarction, Arch. Int. Med.* 103:253-261 (March) 1959.



### Anesthetic Deaths

Death in the operating room may be due to one of several possible causes. These include hemorrhage, shock, basic disease, vagal reflex, anesthesia, and combinations of these factors.

Death from hemorrhage usually poses no question as to the responsible (Continued on page 447)

#### CLINICAL AND LABORATORY SUGGESTIONS

(See pages 436 and 437)

Forms to be Used by Contributors

To: Clinical and Laboratory  
Suggestions Editor

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708 Church Street  
Evanston, Illinois

From: \_\_\_\_\_

Subject \_\_\_\_\_

Explanation of Procedure:

Sketch:

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factor. Rapid loss of blood is more harmful than the slow loss of an equal amount. The loss of a particular amount of blood may be fatal if hemorrhage is rapid. Slow loss of blood, however, may cause only mild shock. Blood should be administered to the patient as fast as it is lost, since the object is to replace and maintain the normal volume of blood within the vascular system.

Shock is rarely a cause of death in the operating room. Surgical shock is actually caused by a combination of factors, of which blood loss is the most important. If the replacement of blood during the operation is adequate, few instances of death are seen.

Some patients die in the operating room as a consequence of a serious disease which exists before the operation. The serious disease may be the reason for the operation, or it may be present in a patient who has an additional condition. An autopsy should be obtained on every patient who dies in the operating room. Often an otherwise unexplainable death may be found at autopsy to have an undiagnosed pathologic lesion as the responsible factor.

During the course of many operative procedures, the condition of the patient may be adversely affected by "vagal reflexes." In a few instances these reflexes have been considered as the responsible factor in the death of a patient.

The administration of an anesthetic causes important changes in the two physiologic systems which are most important for maintaining life, namely, the respiratory and circulatory systems. Life can be maintained only with the constant and uninterrupted provision of oxygen to the vital organs. The respiratory system is responsible for bringing oxygen to and through the alveolar membrane. The circulatory system is responsible for bringing oxygen from the alveolar membrane to the vital organs.

Anesthetics interfere with the function of the circulatory system by causing vasodilatation and by decreasing the efficiency of the myocardium. In most instances, healthy persons show

(Continued on page 454)

## Contra-Angles



### Diet and the Coronary Arteries

In the past month two young men of my acquaintance have dropped dead from coronary occlusion. One was 40, the other 43. Neither had a history that would suggest heart disease. These grim tragedies are occurring in every community. In one issue of the *Journal of the American Medical Association* the deaths of three young physicians (ages 35, 42, 46) from coronary disease were reported.

What is the cause of coronary occlusion? Or causes? No one knows.

Genetic faults have been suspected. Environmental stresses have been mentioned. Nutritional imbalances have been considered. Whatever the causes it appears that death from coronary disease is reaching into the younger age brackets, particularly among men.

An editorial in the *Journal of the American Medical Association* gives a summing up that represents the paucity of knowledge on the subject of vascular disease:

"It should be some consolation to those who like their work and its rewards more than they do ice cream, butter, and eggs, that frustration may do them no harm if they can learn to live on fish, lean meat, fruit, and the low calorie vegetables, rather than potatoes and bread. For those who have, or who dread, coronary disease, it would seem that avoiding food which nature provides for infants, calves,

(Continued on page 448)

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and embryonic birds might be far more effective than tranquilizers or 'slinking out of the race, unexercised and unbreathed' in an attempt to avoid frustration. Since the most sedentary of all physicians, psychoanalysts, seem to have a high death rate from coronary disease, more exercise and less struggle with one's past frustrations may also be recommended.

"The final conclusion from our present knowledge is that stress, which was rated the prime factor in causing tabes, tuberculosis, scurvy, and many other diseases before the specific factor was demonstrated,

bears the same relation to atherosclerosis. It accelerates the progress of a disorder; it may make the difference between latent and lethal manifestations of many diseases, but it is not the cause of any of them. Stress hastens use of ascorbic acid by the adrenals; it reduces resistance to infections by mobilizing corticosteroid; it raises plasma lipid level and thus allows infiltration of the intima and the formation of clots in veins or diseased arteries. Diet certainly is the main factor in achieving protection or in predisposing to early disability and death from clots in veins and from

clots or plaques in arteries. Those who are habituated to diets rich in butter, eggs, and stall-fattened pork and beef know that the doctor's job is to find a drug which will prevent trouble even on the richest diet. But until a safe way is found to change the metabolism of those prone to vascular disease so they can handle rich diets in the same way as people with no such weakness, doctors and even the food industry will have to consider the dietary control of vascular disease as a matter of primary importance."

Whatever the causes of coronary artery disease may be we can be reasonably certain that there are some things that modern man is doing in his everyday living that are destructive to him. The first stressor that comes to mind is malnutrition. This kind of malnutrition is not from lack of food but from too much food of the wrong kind. As the *Journal of the American Medical Association* editorial suggests it may be unwise for man to live on the foods that were intended for infants and calves. Should man live on refined foods from which the protective nutrients have been removed? The principal eviscerated foods are white flour and white sugar. Should man live on foods that have been sprayed with poisons, injected or implanted with hormones and antibiotics, treated with chemicals?

Food, air, water are three things that all human life requires. We are poisoning all three and are thinking of ways to add more noxious elements. The people who raise their voices to protest against these forms of biologic pollution are reprimanded and assailed by the vested interests who have something to sell and by people (including college professors) who are subsidized in one form or another.

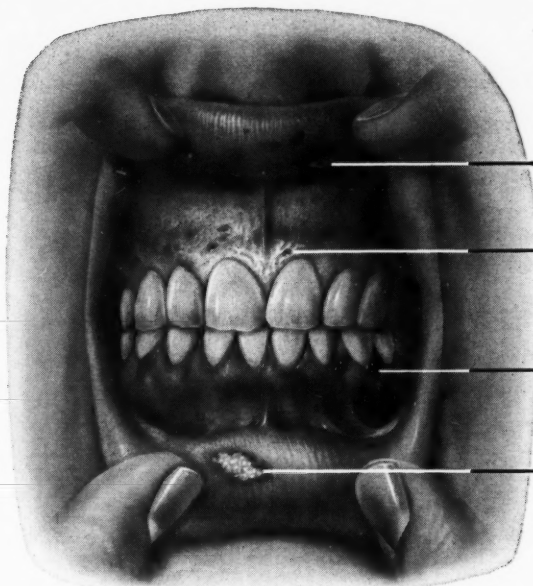
With people dying too soon from the degenerative diseases it would seem more to the point to understand the cellular affairs of earth people in health and disease than to put a man on the moon. There are economic, social, and biologic imbalances on this planet that need correction before we invade other planetary systems.

(Continued on page 450)



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**References:** 1. Zegarelli, E. V., and others: *Oral Surg.* 13:170 (Feb.) 1960. 2. Zegarelli, E. V.; Kutscher, A. H., and Silvers, H. F.: *J. Periodontol.* 30:63 (Jan.) 1959. 3. Katz, E.; Zegarelli, E. V., and Kutscher, A. H.: *Ann. Dent.* 19:40 (June) 1960.

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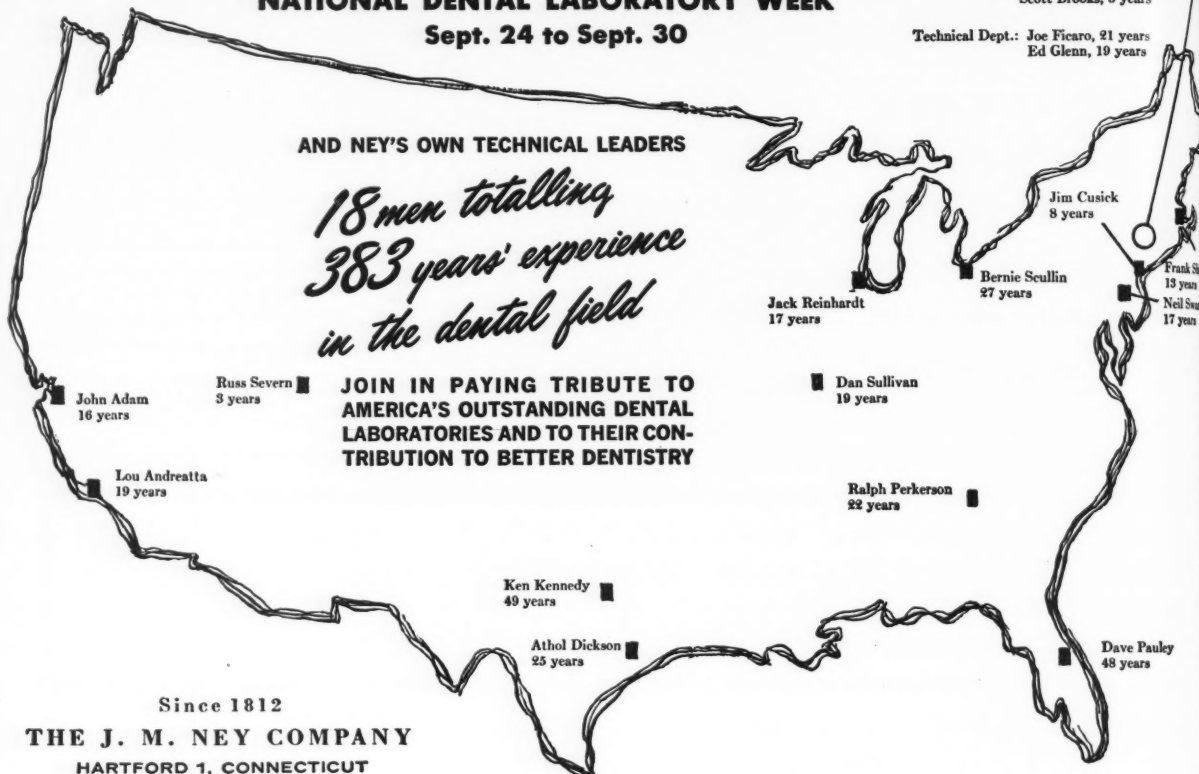
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It is encouraging to read that the Church of England has proposed a way to spread courtesy on the highway—with a "thank you" sign that could be lighted with a button. We use horns and lights to show our displeasure, lungs to express our aggressions, but no one before has suggested a gadget to use to express our thanks for courtesies extended in traffic.

Discourtesy on the highway is an affliction that has spread wherever the motor car has appeared. The report of the Church of England applies to customs in the United States as well as in Great Britain.

"The advisers branded young men in small delivery trucks as the most discourteous drivers, closely followed by middle aged men with an inferiority complex who drive worn out cars but refuse to admit the presence on the road of any better ones.

"Third place went to 'the stout, bald tycoon who has just bought an expensive car and thinks he also bought the entire highway.'

"There is no particular glory in being able to drive an expensive car," the advisory concluded, "just as there is no shame in running an economical one. Real pride should come from standards of driving."

### "What Your Dentist Should Charge"

The Redbook Magazine is not the usual place to turn for articles on dental affairs and fees. Under the rather ominous title "What Your Dentist Should Charge" the magazine explored this subject. Although a dentist

may quibble about some of the fees quoted (both too high or too low) the overall emphasis is on prevention and the economics of early dental treatment. For this sensible emphasis the editors of Redbook should be applauded.

It is unlikely that a dentist could be found who would disagree with this philosophy:

"Patients can protect their pocket-books by overcoming their embarrassment about discussing fees in advance. When a dentist's estimate is likely to run into more money than you can afford, there is no reason not to speak frankly with him—particularly since over a fourth of all dentists vary their fees according to patients' income and ability to pay.

"It's patients, not dentists, who are embarrassed," says an official of a dental insurance plan. "Dentists don't mind discussing fees. They'd rather have a clear understanding and reduce (Continued on page 454)



By M. MICHAEL COHEN, D.M.D., Assistant Clinical Professor of Oral Pediatrics, Tufts University School of Dental Medicine, Boston, Mass.; Consultant in Dentistry for Children, United States Public Health Service; and 16 COLLABORATORS. Just published. 2nd edition, 570 pages, 6 3/4" x 9 3/4", 412 illustrations. Price, \$15.00.

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Pittsburgh 22,  
Pennsylvania

## MEDICINE AND THE BIOLOGIC SCIENCES

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little effect, whereas seriously ill patients exhibit profound changes. The effects of anesthetics on the respiratory system are seen far more often than those on the circulatory system.

Jacoby, Jay J.; Wooley, Andrew; Ray, Hugh L.; Muller, Harold; and Welch, C. Merle: *Role of the Family Doctor in Preventing Anesthetic Deaths*, *M. Times* 87:761-766 (June) 1959.

## CONTRA-ANGLES

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the chances of not being paid later."

"Nor, in view of the startlingly wide price ranges that exist, is there any reason a patient should not consult another dentist if he feels an estimate is too high, or at least ask his own dentist whether or not the work could be done adequately and more cheaply if different materials were used.

"Most important of all is to keep in mind that the real savings in dentistry come through prevention. A small annual expenditure of time and money each year for x-rays, prophylaxis and fluoridation treatments (when necessary) will do away with much of the need for costly corrective dentistry. It is far cheaper and easier to avoid dental trouble than to suffer with it and pay for it."

Years ago when my oldest daughter was 9 she volunteered to help me write a paper on practice management that was to be read before the American Dental Association. I have never found anyone who could improve on the advice that she gave dentists on how to treat their patients: "Give them good care on their teeth, not to charge them too much, not to cheat them in any way."

A friend of mine who heard me attempt a 40-minute enlargement on this advice told me that I should have sat down after I read my daughter's single sentence statement. He was right!

—E.J.R.

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